

FEBRUARY, 1979

Petersen's Photographic Magazine

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Mamiya RB67 PRO-S

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ON the SCENE

the EDITORS

OUT OF THE SHADOWS AND INTO THE LIGHT



KRUSE-SMITH



BROOKS



YOB



RABELLINO



SOLOMON



ZUCKERMAN



SCHRADER

As we eagerly await the appearance of the proverbial groundhog and his capricious shadow, the churlish rodent slumbers peacefully, oblivious to his significance in the cosmic guessing game. Will the beast's shaded image doom us to several more weeks of winter, or are we to be blessed with some much-anticipated springtime weather? Just in case the icy winds prevail, we've filled this issue with captivating indoor projects and processes with which to beguile your jaded post-holiday spirits. . . .

One such endeavor is proffered by Movie Editor **Markene Kruse-Smith** in her informative feature, "Screenwriting." The article provides an in-depth look at the art of writing for motion pictures, with sample scripts as well as tips on terms, techniques and sundry other areas of cinematic lore. . . .

Contributing Editor **David Brooks** has emerged from reams of paper of a different sort, and in "The Great Paper Chase" he presents results from weeks of thorough research. Brooks tested all manner of black-and-white printing papers to determine, once and for all, the best method possible to obtain excellent print quality. You'll be fascinated by the data. . . .

Along these same lines, with this issue we premiere the first of a series of articles introducing "The Yob System." Contributing Editor **Parry C. Yob** reveals a comprehensive technique for exposing, developing and printing perfect pictures using a whole new system of photography. If your cage is one of those rattled by Yob's amazing new approach, feel free to write the author, care of PhotoGraphic. Inquiries are encouraged. . . .

With all this emphasis on printing photographs, we couldn't ignore the basics, and two diligent staffers address their efforts toward filling you in on exactly what enlarging papers do and how they compare with and differ from each other. Features Editor **Elissa Rabellino** and Managing Editor **Charlene Marmer Solomon** present a comprehensive chart and an index to manufacturers along with their "Black-and-White Paper Primer." . . .

Photographer **Jim Zuckerman** describes a simple and effective way to superimpose images in "Great Double Exposures the Lazy Man's Way." All you'll need are some interesting slides, two projectors and your trusty camera to combine your best efforts into images that are far more interesting than the sum of their respective parts. . . .

In this month's "Blueprint" on "How To Build a Background Projector," **John Schrader** shows do-it-yourselfers how to jazz up studio portraits. A simple gizmo can be constructed to supply a background light and pattern guaranteed to elevate standard portraits from the prosaic to the sublime. . . .

This month's portfolio showcases the lyrical landscapes of **Mike Kenna**. Kenna seems to tiptoe along the edge between minimalism and impressionism in his misty renditions of scenes evoking dreamscapes in their soft, ephemeral subtlety. . . .

COMING NEXT MONTH:

HOW TO USE COLOR—Chromatic wonders can be yours.
NEW IDEAS FOR PROPS—Techniques borrowed from stage and screen.

BASIC 35MM PHOTOGRAPHY—Interchangeable lenses and how to use them.

PLUS:

THE YOB SYSTEM—Continuing a fascinating new approach to photography.

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There may have been a full moon that night over the Mexico City cathedral in this month's cover photograph by Jim Zuckerman, but it wasn't this one (or this full). The extraordinary juxtaposition was created by double projection of two separate transparencies through two projectors onto a screen (with the cathedral shot projected through a blue filter). The "double exposure" on the screen was then photographed. To learn more about this versatile technique, turn to "Great Double Exposures the Lazy Man's Way," beginning on page 82.

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fidelity*

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sharpness*

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elimination of
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Shadow dancing, with the



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Another example of the creative versatility that has made the 283 Electronic Flash System the best selling Vivitar flash.

The Complete Light Machine lets you take a decidedly unorthodox approach to electronic flash photography. It's every bit as portable as the less sophisticated shoe-mount electronic flash units that came before it. But because it's a complete lighting system, with an intriguing array of power options, special effects accessories, and pro-type tricks of the trade attachments, you can use studio type lighting techniques almost anywhere you go.

To create the photograph on the opposite page, the photographer spread a truck-load of sand on his studio floor. That technique is a bit difficult if your studio happens to be your living room. Neither your spouse nor your landlord is likely to understand and the clean-up may be too much for your vacuum cleaner. After creating his mini-desert, the photographer positioned his model and proceeded to light the scene with a Vivitar 283 Complete Light Machine. He placed three 283 flash units with 28mm Flash Lenses inserted in each unit's Lens/Filter Adapter above and behind the model. The units were separated by about one foot, one above the other. In the Lens/Filter Adapter on each unit was a different colored flash

filter in addition to the 28mm flash lens. Another 283 flash with 135mm flash lens was positioned in front of the model for fill light. The camera angle was quite high, well above the single flash unit. The multi-color backlight units were fired in sync with the fill unit by cordless SL-2 remote flash triggers activated by the fill unit. The three units behind the model cast the multi-colored shadows on the light sand while the front unit gave the proper fill exposure for flesh tones and the pastel costume.



Vivitar 283 Auto Thyristor Electronic Flash - Guide Number (ASA 25) 60. Features: Thyristor circuitry, Automatic exposure in 4 f-stops, plus Manual, Remote sensor. Sufficient light indicator signals correct flash exposure. Open flash control. **Optional Accessories:**
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SL-2 Remote Flash Trigger -

Cordlessly fires remote flash units in sync with main flash.

Quick Release Pistol Grip and Camera Brackets - For use as off-camera flash



either direct or bounce. The flash shoe rotates 360°. Available in both 35mm and 6 x 6 models. Accepts an optional cable release.



Ask your participating Vivitar dealer for a copy of *Advanced Lighting Techniques with Vivitar Electronic Flash Systems*, a booklet with examples of creative flash photography complete with lighting diagrams and full descriptions of the photographic techniques.

Vivitar 283

The Complete Light Machine.

Vivitar Corporation, 1630 Stewart Street, Santa Monica, CA 90406. In Canada: Vivitar Canada Ltd./Ltée. © Vivitar Corp., 1978

□ Now that we have a basic understanding of simple light terminology, we can begin to master working with light and our photographic equipment effectively. Light meters are the tools of light measurement. A practical approach to their proper use will go a long way toward ensuring that you achieve your desired results.

The most frequent problem associated with the use of light meters is simply poor interpretation of the information provided by the meter. Only the photographer who understands what his meter tells him can correctly apply the information to achieve the final print he wants. In the early days of photography, the photographer was totally on his own in determining the brightness of a scene and how best to record it with his camera. Our sophisticated equipment of today is wonderfully helpful, but we must still be prepared to interpret, analyze and evaluate the information it provides—then we can override the light meter and adjust camera settings accordingly when the situation demands it.

There are several different types of meters, including incident-light reading, reflected-light reading and spot. All meters—no matter what type, whether built-in or handheld, of any brand or manufacture—are capable of only one thing: They "see" only middle gray. The meter does not know what you know or understand what you see; it can only tell you what camera settings to use to render everything middle gray.

An incident-light meter is one that measures the light (illuminance) that falls on the subject without regard to light-absorption qualities of the subject. A domed light collector is characteristic of this type of meter; it diffuses all the light that strikes it. An incident meter should be used at or near the subject position and *facing the camera*. Light on the meter's dome must be the same as that on the subject. This type of meter, therefore, is not appropriate for distant scenes, for example. It would be particularly useful, however, when your entire subject receives the same light and you can easily get near the subject to take a reading. Examples of such a situation may be in the studio or open shade outdoors. Take care in metering to shade the light diffuser with your hand if the subject is partially shaded; or, if the subject is backlit, the incident meter must be held in the shadow of the subject facing the camera. Incident meters tend to perform better in comparison to other types in instances where light tones (snow or

beach settings) predominate.

The reflected-light meter is the second type; it measures luminance or reflected light. These are the meters that are built-in to camera bodies or, with restricted angle of acceptance, become the third, spot-type meter. These meters are used at camera position *facing the subject*. Faulty use of this type meter can result from aiming it incorrectly.

Assuming you wish to render an equal amount of detail in both shad-



A system equipment approach like this Calcu-Light meter makes measuring light values in most any situation easy and accurate.

ow and highlight areas, a simple solution to correct this problem is to use the brightness-range-measuring technique. First take a reading from the darkest portion of your subject in which you want detail, and follow that by a reading from the lightest portion or area in which you wish to render detail. Finally, average these two exposures to determine the actual camera setting. A gray card is an invaluable aid when using a reflected-light meter (see "Understanding the Gray Card," January, 1979 issue). The average-reading meter tends to perform better than other types in situations where the subject is very dark and absorbs most of the incident light. (See also "One to One" in this issue).

An early meter, the actinometer, used a sensitive paper that darkened when exposed to light. Since then, each advancement has brought faster, more convenient and easier-to-use light meters. The newest meters today utilizes digital LED's.

Quantum Instruments' Calcu-Light is one of that new generation and

one of many meters that offers both incident and reflected readings. This particular meter features a light "turret" that flips easily between a light-collecting dome for incident readings and a flat side for reflected readings. The dome covers a 180° measurement area while the reflected-light-reading side of the turret covers a 30° field. An optional turret, SX-1, is available to cut the measuring angle to 10° for spot readings.

The Calcu-Light uses a blue-enhanced silicon photodiode light sensor and bright, recessed GaAsP LED's that are easy to read in any light. The digital information readout eliminates switching between low and high ranges and incorporates a weak-battery warning signal. The numerical 64-step scale covers a 21-f-stop range with each digit representing 1/2 stop. The numerical readout greatly facilitates and simplifies the use of the brightness-range technique described earlier. A memory button recalls most recent measurement.

The unit measures a far higher range of brightness than most other meters available for accurate readings off chrome or other highly reflective surfaces, or in a snow or beach setting, for example. Specifications include an f-stop range of f/7 to f/181, shutter-speed range of 1/4000 to one hour, and a film-speed range of ASA .05 to 800,000.

This unit has no internal moving parts. Manual settings include only the film-speed index and the calculator dial, which is clearly marked for incident and reflective readings and also provides movie and exposure value information.

This compact, four-ounce meter has a suggested list price of \$160 and is a product of Quantum Instruments, Inc., 1075 Stewart Avenue, Garden City, New York 11530. Some of the accessories include the SX-1 spot attachment, \$30; FOX-1 fiber-optic probe for groundglass or focusing-screen measurements as well as negative densities, \$20; two filter sets, CFX-1, \$30 and CFX-2, \$23; plus empty filter holder, individual filters and a flat diffuser for studio-type contrast measurements.

When you acquire any new meter, it is advisable to run a few test rolls of your favorite film to determine the accuracy of the unit. If your results are consistently overexposed at indicated settings, the meter is reading low and you can compensate by adjusting the film-speed index to a higher setting. Just the opposite is true, of course, if your results are consistently underexposed.

Now, you can master light value measurement! □

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The Celestron 90 System

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☐ Featured elsewhere in this issue is a moviemaking article entitled "Screenwriting." It's soon to be followed by an upcoming feature on movie storyboarding. Both of these techniques—one verbal, the other its visual counterpart—can be very useful methods for getting filmic ideas on paper, and therefore out of the nether world of dreams and subconscious ponderings and into more tangible form.

Being a writer as well as a photographer/filmmaker, I know how difficult it can be to construct the first few sentences of any piece. After you've got the first several lines, though, the idea begins to gel, and whole paragraphs of coherent thought spring into being. Then it's often all your writing utensils can do to keep up with the onslaught of scintillating prose emanating from the quickly moving fingers.

Well-acquainted with the creative process, the ancient Greeks realized that no flash of genius or inspiration can come without the benevolent aid of one or more of nine muses. These muses, of course, are the mythological goddesses who preside over literature and the arts and sciences. Early in my own artistic career I learned the value of maintaining good relationships with, if not outright courting, these omnipotent goddesses. In fact, when I sit down to write, I usually leave out a bowl of fruit for them.

Regardless of who consumes the fruit, it's common knowledge among writers and other creative geniuses that muses often dawdle. Therefore, it's wise to plan activities with which to occupy the time it takes for a muse to notice your artistic struggle and descend to aid in the genesis of a creation. Along with fresh typing paper and a few plums and oranges, I like to bring a bottle of nail enamel to the typewriter. Alizarin-crimson polish may seem an unlikely item with which to grace an altar to the goddesses, but it has its purpose, as you will see, for I am about to reveal my own personal ritual for inciting the muse. The ritual mostly involves waiting. It has been my experience that, with perseverance and faith, one or more of the muses is certain to appear.

I begin the vigil by inserting a piece of paper into the typewriter carriage, rolling it between the paper holders, and indenting seven spaces (a lucky number) so the first paragraph can be begun at the exact moment in which the muse deigns to appear. I then sharpen eight or nine pencils. This is to prepare for the possibility that typing may be too mechanical a process for the delicate

FOCUS ON FILMMAKING

MARKENE KRUSE-SMITH

WHAT TO DO WHILE YOU'RE WAITING FOR THE MUSE

nature of the thoughts that will be transmitted from the spirit world.

Subsequent steps in my procedure for eliciting response from above involve watering houseplants, emptying ashtrays and making periodic forays to the kitchen in order to check out the contents of the refrigerator. These activities all provide suitable diversions from the inevitable task of facing vast expanses of empty paper. It may be a good idea to brew a pot of coffee or tea. (Muses prefer theirs



sweetened with honey, since white sugar tends to interfere with concentration.) While you're up, you might try to locate a deck of playing cards. These can be dealt out on any relatively smooth surface that's in close proximity to the typewriter. Besides passing the time, one quick game of solitaire helps get the fingers warmed up for the heroic deeds that lie ahead.

Still no muse? You could try calling one. My own favorites are Calliope and Thalia. The former, often confused with the keyboard instrument having a series of steam whistles, which is named for her, is in fact the muse of eloquence and epic poetry. While the Irish kiss the Blarney Stone to obtain these qualities, equally

good results can be achieved by merely closing your eyes and summoning Calliope by name.

Sometimes Muse Thalia comes instead. Married, on separate occasions, to Charlie Chaplin and Walt Whitman, she inspires comedy and pastoral poetry. She often appears with her sister Terpsichore, the muse of dancing. This is very dangerous, because Terpsichore can have you out of your chair and doing the latest version of the L. A. Hustle in no time at all. This will be a distraction when you're really just trying to write.

The other six creative spirits are Clio, the muse of history; Euterpe, muse of music and lyric poetry; Melpomene, muse of tragedy; Erato, who inspires erotic poets; Polyhymnia, muse of sacred poetry; and Urania, the muse of astronomy. None of the photographic arts had been invented when the muses were born, so they all take turns inspiring filmmakers and photographers. Each has a distinctly different quality to offer visual artists, and these various perspectives explain the existence of comedy, tragedy, erotic art and movement in pictorial representations as well as the variety of camera angles and lenses chosen to convey these themes. But I digress.

Back at the typewriter, the would-be screenwriter begins to realize that until the muse arrives, he or she is totally alone. With this sudden, heady awareness, I usually uncup the bottle of nail enamel and begin to polish my toenails. Writers who are less vain or frivolous often opt to take a walk at this point. Both activities help to free the mind, and many times a brisk trek around the block or the application of a couple of coats of brightly colored polish will revive the most recalcitrant imagination. The efficacy of these exercises can be augmented by whistling or humming a favorite tune. Euterpe isn't the only muse who likes music; they all do.

If you've diligently applied the preceding methods to the quest, those clean white pages will fill up soon enough. In the meantime, one last and not unpleasant diversion remains: call a friend. Say that you are writing, but you wouldn't be adverse to taking a break. There must be one or two good movies playing around town. Who needs popcorn? You can bring the plums.

I have by no means forgotten the writing you set out to do. Leave all your materials out, grab your coat and keys and hurry out the door. The house must be absolutely empty and completely quiet. Whatever you do, don't put away the oranges before you go. Elves love oranges. □

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☐ Automation! Mention that word to a group of photographers, and chances are you'll get a variety of answers ranging from "Garbage!" to "Great!" However, despite the reactions of purists and the uninformed, it is no great secret that automation has come to photography.

In fact, thanks to automation, more and more people are now able to enjoy using a camera and to record events in their lives that are important to them. However, despite the ease and simplicity with which one can now produce a full-color transparency, color print or black-and-white print (thanks to the availability of rapid photofinishing plants), there remains one area of redoubt that too few have decided to challenge: the darkroom. For those of you who have dragged your feet in dreaded awe of this important facet of the photographic experience, I assure one and all that it is in the darkroom where one can be truly creative—where ordinary snapshots can be made into great photographs.

Ah, but I'm certain that some of you will steadfastly maintain that the darkroom is an area of alchemy you dare not dabble with. You should know that the darkroom is now as simple to enjoy as your fully automated cameras. For automation has come into the darkroom—particularly the heart of the darkroom, the all-important enlarger!

Where once such jargon as "density range," "density change," "aperture," "magnification range" and so many other strange and esoteric-sounding references would panic a brass statue, there is now full automation that makes it possible to make enlargements (and therefore control composition, contrast and the size of one's prints) just as easily as one can now produce perfectly exposed negatives or transparencies.

The enlarger I'm speaking of comes to us from Omega (division of Berkey Marketing Companies), and it's called the System Six CS-50. It is a truly remarkable piece of equipment with which one can make black-and-white enlargements or full-color enlargements with relative ease, thanks to automation. However, for those who are at the entrance level of investigation, let's zero in on how it is used to make a black-and-white print (color comes later), because most of us learn how to make enlargements in black-and-white first.

Let's say you've produced an excellent roll of black-and-white negatives using such cameras as, for example, the Konica AF Auto Focus or the Konica FS-1 35mm single-lens reflex. You have selected a negative

Guide Lines

PAUL R. FARBER

THE AUTOMATED PHOTOGRAPHER

for enlarging. So, in the darkroom you insert the frame into the enlarger's negative carrier and turn on the enlarger. Then, in the dark you project and focus the image the way you want it to look in the finished print. An amazing easel, *built into the baseboard*, makes this a breeze.

Next, using the *built-in* probe, you place the sensing cell under a projected shadow area (light area on the easel—it's a negative image, remember?) and bring the two *built-in* LED's



The logical addition to a fine automated camera is a fully automated enlarger. Shown above is the Omega System Six CS-50 enlarger.

to a null position by adjusting the enlarger lens. Then you place the probe under a highlight area (dark, on the easel) and bring the built-in LED's to null by adjusting a range dial on the probe. Finally, you read a number in the probe's window and apply it to a chart, which will tell you which contrast grade of paper is to be used (or which variable-contrast filter is to be used if you're using a variable-contrast paper, such as Kodak Polycontrast). At this point, you've determined the contrast of the negative, even if you don't understand what contrast range is, and you've matched it to the necessary enlarging paper (something like measuring your foot before you buy a pair of shoes).

The next step is to make a test-strip exposure on a sheet of enlarging paper. After processing the test-strip, and after it has dried, you examine the print to determine which segment represents the right expo-

sure. Let's say it is ten seconds. You then set the enlarger's *built-in* timer to ten seconds (and do not disturb the enlarger's settings), making certain the predetermined contrast number is still set on the probe, as determined in the first step.

The probe is then set under a projected reference area (such as a flesh tone or whatever you select), and a switch is set, momentarily, to a position called "SAMPLE." Then the switch is returned to a position called "STORE." At this point, another dial, called the "AUTOMATIC REFERENCE DIAL," is adjusted until the two LED's are nulled (or of equal brightness). The enlarger is now programmed and will accurately and automatically expose for the type of enlarging paper tested, regardless of changes in film density, lens aperture or magnification. Now, how's that for automation?

After this, a sheet of enlarging paper is placed on the easel and the start button pushed. The enlarger turns on and off automatically. All that remains is to process the exposed print in print trays, or you can avail yourself of an inexpensive daylight processing drum and process the print in a fully lighted room in less than six or seven minutes!

Okay, you now have a print that you like—sort of—but you feel it could be improved with additional cropping or whatever. In any case, you have to change the magnification. So, you go back to the enlarger, turn on the unit, and raise the head by a few inches to improve the composition or to eliminate a distraction. You place the probe in the reference area and adjust the lens aperture until the two LED's are again nulled, whereupon you insert a fresh sheet of paper and press the start button. After processing you'll discover that the print is identical in tone and range, despite the fact that you changed the magnification. Automation made it all possible. And if you want to print another negative on the roll, all you have to do is to insert it into the negative carrier and once again adjust the composition, degree of magnification and focus as before. Then, place the probe into the reference area, null the two LED's, and make an exposure. It's as simple as that.

Why not drop into your local camera store and have them demonstrate the unit before your very eyes? Chances are, once you see it in action you'll be making enlargements that very same evening—prints you'll be proud to exhibit. And you can thank automation—and Omega—for the fun. ☐

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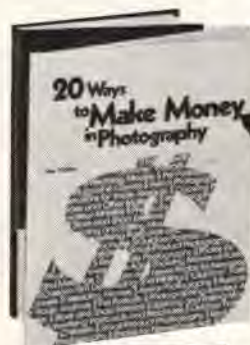


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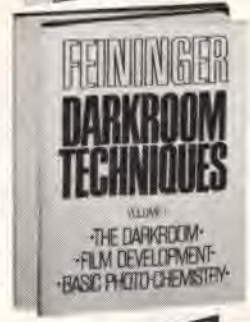
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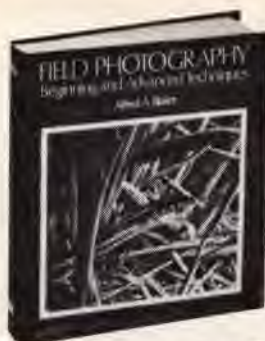
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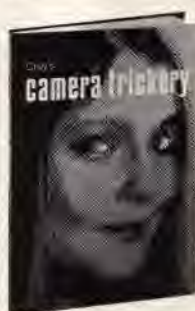
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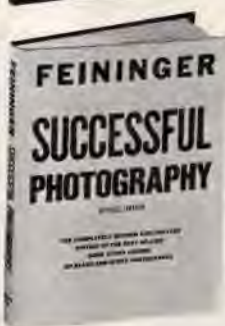
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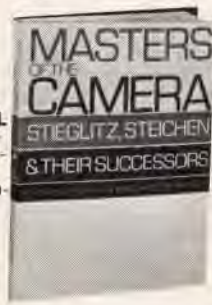
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□ As I plug in the typewriter to begin this month's column, the theme song of Mel Brooks' film *High Anxiety* is reaching a crescendo in my head. Trying to meet a deadline, missing the last train home, or dropping a camera and watching the front lens element roll into the gutter are hateful sources of h-i-g-h-a-n-x-i-e-t-y. Every day we experience anxiety, and while we broadly guffaw at Brooks' hysteria, when it's our own, it's less than laughable.

Before you scratch out a complaint demanding that I address my topics to photography and not *Psychology Tomorrow*, let me assure you I will. I suspect this page will prove most helpful in photography... and in daily living. And isn't everything inter-related anyway?

I know a high-powered Madison Avenue executive of a huge color lab who rises at the crack of dawn every day and lingers about the grounds of his peaceful, dew-dipped country home taking pictures. For him, photography is a way to cope, to ease stresslessly into the day before climbing into the pressure cooker of the working megalopolis.

Knowing of this man's use of photography, I felt justified in attending 3M's free seminar "Personal Stress: Overview and How to Cope." Surely it would be deemed "in the line of PhotoGraphic duty," especially since 3M makes photo products such as spray mount adhesives, film, static eliminators. (And Titrilac Antacid? Yep, through their Riker Lab subsidiary who sponsored the seminar, but...!) After listening to and ruminating over the material, I decided it was wholly appropriate to share.

Dr. Frederic Flach, Clinical Professor of Psychiatry, asserts that an enormous parallel exists between the process of recovering from stress and creativity. In the true classical sense, creativity requires the ability to "forfeit old ideas and accept new ones." Since stress is essentially an outgrowth of change—life changes such as marriage, job shifts, divorce, and small but aggravating daily changes—our reaction to change and recovery from it require adaptability. According to Dr. Flach, we need to be resilient in order to handle these changes gracefully.

It makes sense. Don't we need to be resilient to create photography too? I'm clearly a believer in surrendering dusty concepts and applying fresh attitudes toward picture taking. In fact, I have been trying to stimulate creativity in this very space. I've given basic techniques alongside ways to deviate from them to foster personally meaningful photographs.

In sight PEGGY SECILFON

STRESS POINTS

In composition, for instance (see "In Sight," April, 1978 issue), I discussed the classical rule of thirds and in the next breath talked about Garry Winogrand's askew horizon lines.

However, "you don't need talent to be creative," insists Dr. Flach. The key is flexibility, enabling you to break from old traditions and embrace new ones. Granted, it's tough to do. Giving up the safety of "tried-and-true" can even cause stress; but at the same time it promotes growth (a positive effect of



What do karate and photography have in common? Each can be a technique for relieving s-t-r-e-s-s. Want to know how? See text. (Photograph by Michael Mulqueen made with a 2 1/4 x 2 1/4 Mamiya C220. He used an electronic flash unit and floodlight combined with a slow, 1/4-second shutter speed on Kodak Tri-X Film.)

stress). Think of those photographers who are reluctant to trade in yesterday's single-lens reflex cameras because adjusting to newer models requires learning new ways of picture-taking with auto modes and—horrors!—electronics. Some folk have difficulty adapting and fear change. But change can be beneficial too.

Various techniques can actually calm the hazardous effects of stress, provided you have a strong belief in the process you choose and in its effectiveness for you. Dr. Flach named a few: yoga, relaxation, meditation, biofeedback. He neglected to mention photography, but that has certainly been successful for my executive friend. Most stress-panaceas incorporate exercise (e.g., yoga, jogging) or mental concentration (e.g.,

meditation). Photography combines both techniques.

Unless you're an armchair photographer, you are in motion when taking pictures; bending knees, lying, crawling, climbing ladders or mountains. Physical activity seems to reduce the physiological effects of stress because somehow it neutralizes anxiety-produced chemicals.

Hand in hand with the physical attribute of photography is its need for concentration. The activity demands attention to details—calculating exposures, composing, seeing, thinking, acting. So it provides a delicious distraction from other facets of daily living—from niggling problems, work hassles or from giant traumas. It may be only temporary relief, but perhaps enough to allow recovery from the current crisis, which Dr. Flach emphasizes as the most important ability for overcoming anxiety.

In an uncomfortable situation, by shielding your eye with a camera you can actually distance the event and render it tolerable. In *Gramp*, an impassioned book about an old man overwhelmed by age and senility who chooses to die and is supported by his family, photographers Mark and Dan Jury present a heart-rending documentary of their granddad. By probing with cameras, Dan and Mark placed *Gramp's* death in an "objective" framework, making the anguish more endurable.

Travel encourages use of photography to reduce direct confrontations. Susan Sontag said, "The very activity of taking pictures is soothing and assuages general feelings of disorientation that are likely to be exacerbated by travel."

When feasible, Dr. Florence Denmark (seminar moderator) recommended learning about a situation before plunging in and trying to control it. Planning can vastly reduce anxiety, whether applied to taking pictures, final exams or even getting married.

Finally, since stress can cause depression and alienation, the level of anxiety you experience can affect how you view the world and might be reflected in your photography. I know a photojournalist who recorded other people's lives until a major event altered her own. Suddenly her camera turned inward. She began to photograph herself in fragments of her fading past. Thus, a dramatic change in the type of pictures you take may be a signal of stress overload!

The 3M Company plans to offer more free seminars throughout the country. For information write to Lee Horn, 3M/Riker, 135 West 50th Street, New York, New York 10020. □

A NEW GENERATION



When we promised a "New Generation" of photography with the introduction of the AE-1 in

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Shutter A

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Official Camera of
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Buenos Aires, Argentina

USING THE A-1



The new Canon A-1 is more than just the most advanced single-lens reflex camera in history. More than a technological curiosity. It's a system approach within a single camera. An unmatched vehicle for the solution of the most complex

photographic problems with a truly remarkable simplicity in almost any case. And the heart of the A-1 is its six-mode exposure flexibility. That puts an end forever to arguments about which exposure mode is best in an automatic SLR by simply giving you everything.



AT Dial
Aperture priority shows pre-set aperture.

Shutter Priority shows pre-set speed.

Shutter-priority automation lets you select the speed you want to freeze action, prevent camera motion or purposely blur for dramatic impact. The A-1 selects the proper aperture in milliseconds.

Aperture-priority automation gives you total control over depth-of-field or lets you pick the aperture you prefer best. The A-1's shutter adjusts steplessly to give perfect exposure in any light.

Programmed automation is the A-1's unique all-purpose automation mode. It's great for shooting from the hip, adjusting aperture and shutter *both* over the camera's entire sensitivity range. And in an unmanned application it will continue to give correct exposures even when the lens' maximum aperture has been reached by adjusting for the correct shutter speed.

Stopped-down aperture priority makes the A-1 a *truly* universal camera, giving aperture-priority automatic exposures with anything you can mount on the camera—telescopes, microscopes, pre-set lenses, bellows and extension tubes. Anything.

Flash automation with the A-1 is absolutely the simplest anywhere. With either the Speedlite 199A or 155A all you do is mount the unit and turn it on. When the ready light is on (shown in the viewfinder) your aperture *and* shutter speed are automatically correct. If you shoot before the flash recycles, the A-1 reverts to regular auto exposure.



Manual exposure is just what the name implies. You set aperture and shutter speed for studio flash, special jobs or unusual applications—if there are any you can find that the first five exposure modes won't cover.

But the A-1's spectacular exposure control is only the beginning. Inside, all information is handled in

Six-mode exposure control.
System versatility.
Newer electronics for wider applications.



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35MM CAMERA OF
THE 1980 OLYMPIC
WINTER GAMES

Canon A-1

digital form. Which means it handles a greater amount of information (that's why it has such exposure capability) as well as giving you a totally digital LED readout in the finder. A readout that's invisible until you turn it on and can even be shut off—while still letting the A-1 operate automatically. A readout that gives you a 7-LED display and tells you everything the A-1's doing. Changing every $\frac{1}{2}$ -second as the light changes. And varying in illumination intensity as the light varies. There's never been anything like it.

There's never been a camera that's handled like the A-1, either. All exposure functions can be controlled by the single AT dial, which locks to prevent errors. Different exposure modes are shown by symbol and color code, and only the appropriate scales are visible in each mode.

Exposure can be corrected as much as ± 2 stops in $\frac{1}{2}$ stop increments and an exposure lock helps with really difficult lighting situations.

There's also a two-speed self timer, easy multiple exposures and a host of other control features that are a pure delight to use. With the new Motor Drive MA's smoothness and versatility (up to 5fps with Battery Pack MA) the A-1 is ready to handle any photographic challenge.

Whether you want to use the A-1 as a focus and shoot automatic SLR or explore the technological miracles it can perform, one thing is certain. You won't find anything like it anywhere for a long, long time.

USING THE AE-1



This is the one that started it all. A veritable flood of imitators. Yet the performance and cost efficiency that has made the AE-1 the *number one selling camera of its type* in

the world are still at work helping make it the most sought-after camera anywhere.

In your hands the AE-1 is a compact marvel of thoughtful engineering with the security and ease of shutter-priority automation. Most photographers agree that this type of automation is best for most photographers under most situations. The reason we could put it into the AE-1 comes down to foresight on the part of our FD lens designers. When you have the right lens mount, you don't have to build aperture-priority automation into your cameras. But that's another story.

The AE-1 is a model of direct, uncluttered photographic operation. Shutter speeds fall under your right index finger and apertures selected are clearly visible in the bright, easy-to-focus viewfinder. You can preview your exposure either with the shutter button or a special switch that falls under your left thumb. Just above this switch is a ± 1.5 stop exposure correction button that's just perfect for typical backlit situations.



Used with either the Speedlite 155A or new 199A, the AE-1 is *the* most automatic flash SLR ever. When the unit's ready lights are on, your shutter speed is set to 1/60 sec. (no matter *what* the dial is actually set on) and your *aperture* is automatically set to the proper exposure for the distance range selected. All you do is mount the unit, switch it on and you're ready for perfect flash

The first computerized,
shutter-priority automatic SLR.
The last word in value.



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35MM CAMERA OF
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WINTER GAMES

Canon AE-1

exposures. And if you shoot before the ready light is on, the AE-1 will make a correctly exposed image in the normal auto exposure mode.

The AE-1's automatic operation is enhanced even further by the operation of the optional Power Winder A—a simple auto winder that can shoot single frames or sequences as fast as 2fps at speeds above 1/60 sec. The reason that the Power Winder is so simple—read reliable—is that most of the brains for its operation are in the electronics of the camera.

If compact, automatic, state-of-the-art electronic performance at an almost incredible price is what you're looking for, you'll find it in the AE-1.

USING THE AT-1



If you remember when through-the-lens metering shook the photographic world, you'll love the AT-1. It's the classic through-the-lens match-needle metering camera with a twist. Because it shares the technology of the 'A' Series of Canon SLR's, it has up-to-the-minute performance features that bring this traditional photographic format into the present with a bang.

In use it's almost as simple as the AE-1, with a bright viewfinder and fast, accurate needle centering. And it shares the 'A' Series compactness, great handling and light weight. But what's really exciting about the AT-1 is its access to the great 'A' Series of Canon accessories.

With the AT-1 you get to use the Power Winder A for singles or sequences and both Canon Speedlites, the 155A and 199A. On the AT-1, they set the speed automatically, you set the aperture. And the Databack A gives you date/data recording at the press of the shutter, interchanging with the camera back with a simple press of a button.



If match-needle metering is the way you like your photography—but you don't want to sacrifice modern performance—the AT-1 is just what you need.

THE WHOLE PICTURE

Of course, the Canon 'A' System is part of something a lot bigger—the whole Canon system of SLR photography. In it you'll find



forty of the world's finest lenses. Everything from Fish Eye to Super-Telephoto. And everything in-between. Lenses that have set standards for sharpness, contrast and freedom from aberrations. As well as ruggedness and innovation. Plus a line of accessories for almost every conceivable photographic job under almost any kind of conditions.

Whatever you're planning to do in photography, whatever you've done, you'll see things differently through the Canon 'A' System of cameras and accessories. It's truly a New Generation of photographic performance. See it soon at your local camera specialty dealer's.

Match-needle metering with
electronic flexibility.
Conventional photography redefined.



THE OFFICIAL
35MM CAMERA OF
THE 1980 OLYMPIC
WINTER GAMES

Canon AT-1

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☐ We have been facing an inflationary spiral unlike any other this country has ever experienced. Prices of automobiles, food, appliances, residential dwellings, etc., have skyrocketed past traditional limits. Photographic equipment and supplies have also fallen victim to soaring costs, and during the past ten years prices have doubled, tripled, and in some cases quadrupled. When you consider that today a roll of black-and-white film costs as much as or more than a roll of color film did ten years ago, the situation becomes mind-boggling.

And what of photographers' salaries or fees? Have they increased and kept up with today's economy? According to a number of photographers I have spoken with, the answer is "no." In other words, it would appear that, proportionately, photographers are not making that much more than they did a decade ago. This poses a hardship, particularly to newcomers to the field, who, beset with seemingly nonstop rising costs, are barely able to make ends meet.

Recently a reader wrote to me inquiring how to survive the inequity between earned income and the high cost of living. I replied that the only possible solution was to hold the line on fees for services rendered while cutting the expenses wherever possible. When I say "hold the line," I simply mean accepting assignments that provide a fair margin of profit, as opposed to doing a job where the profit factor is minimal and you are virtually doing the job for nothing.

Another reader asked what I thought was an acceptable gross income on an annual basis—a rather ambiguous question, but I decided to see it through and provide some sort of detailed response in column form for the edification of all concerned.

Obviously, yearly incomes vary from one photographer to another, and the same thing applies to their respective life styles. Life style has an enormous effect on why one photographer might easily manage to live on \$25,000 a year while the same amount might bankrupt another or seem like the land of milk and honey to yet another.

Consider the following: Based on a five-day work week, there are 22 work days a month. From a practical standpoint there are only 13 shooting days, the remaining nine being devoted to or required for darkroom work, editing, captioning, letter writing, billing, shipping and all the other details that must be attended to in the course of following through on various assignments. These chores must be done throughout the month

WHERE THE ACTION IS

DAVID SUTTON

THE INCOME FACTOR

or the assignments will never be completed. I don't count Saturdays, since most photographers use this day to get things squared away in the darkroom or office—a sort of end-of-the-week clean-up detail. As for Sundays, well, everyone is entitled to a day of rest. Admittedly, many assignments take place on weekends, and for that matter, evenings also, but for the sake of establishing a minimum annual income I will use the 22-work-day month and the 13-day shooting period.



Aerial photography traditionally commands high fees. What might ordinarily pay \$250 for an assignment could provide \$500 or more in billing for an aerial job. Assignments beyond the norm not only add to your overall income but raise the average as well. © David Sutton

That being the case, if you adhere to today's accepted *minimum day rate* of \$250 per day, or if your assignments average out at \$250 each, you would theoretically have an annual gross income of \$39,000. At \$200 per day or assignment, your yearly take would be \$31,200. At the lower side, \$150 would bring you \$23,400 and \$100 a low haul of \$15,600.

To a newcomer just getting his or her feet wet, a gross income ranging from \$15,600 to \$23,400 might seem to be a veritable bonanza. Plus, all it takes are several exceptionally high-paying jobs during the year to boost the overall average; the shooting days may conceivably average more than 13 days a month.

As for the \$31,200-\$39,000 range, these figures can easily jump to \$35,000 and \$50,000, respectively, or even more. It all depends upon the type of photography you do, who you do it for, and how actively engaged you are in doing it. Gross income is just an overall sum, for it is the *net* amount that is the important figure to consider. Thus, if you had a gross of \$25,000 and business expenses of \$10,000, your net would be \$15,000 before taxes and personal expenses.

A small, one-man-operated portrait

or commercial studio might have an annual volume of \$35,000-\$50,000 a year, while a larger studio with several employees might gross \$100,000 or more. However, due to the larger overhead and operating costs of the latter, the final net figures for both studios might not be that far apart. By keeping your expenses at a minimum or within reasonable limits, you can increase your net even more.

To repeat, if you gross \$25,000 and you have a business expense of \$10,000, your net or adjusted gross is \$15,000. This figure represents your profit for the year, after which you subtract federal and state income tax plus Social Security (for a hypothetical total of \$3500 or less, depending upon your personal deductions). This leaves \$11,500 (give or take) to live on for the entire year. Anything left over is pure gravy.

While some of the annual incomes I have listed may seem to be completely out of the reach of newcomers to the field, to many established professionals these sums are far below practical operating levels. In short, what might be a substantial yearly income for one individual might be a losing proposition for another.

What, then, can the newcomer expect to earn during the first year or so of free-lancing? To paraphrase an old business adage, If you lose a little or only break even for the first year, you are doing very well! If you are single, don't have an extravagant life style, live in modest surroundings, don't go overboard on business and personal expenses and indebtedness, and you gross anywhere from \$15,000 to \$20,000 the first year, you will have done remarkably well. From year to year, assuming you prosper, your yearly income should continue to increase. At some point your income will tend to level off. Of course any and all of the foregoing are entirely contingent upon your own particular motivation. You face an enormous amount of talented competition, which means that you have to get out and hustle if you expect to be successful.

Finally, becoming financially successful is one thing; maintaining that status is even more difficult. Bear in mind that regardless of your artistic or creative abilities, you must also have a good head for business. If you have no business acumen whatsoever, you should enlist the aid of someone to oversee the management side of your business until you get the hang of it yourself. In the beginning you need all the help you can get, and if such help is available, by all means take advantage of it. ☐

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If you're looking for a better way to process film, get Unicolor's Film Drum II. It's what a serious photographer looks for in a film processor.

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□ There's an amusing commercial on television that goes something like this: A distinguished big-time wire-services pro, the pockets of his trench coat presumably bulging with Tri-X and Pulitzers, circles Mr. Newsmaker like an aging buzzard and just keeps snapping away with his compact 35mm single-lens reflex. He keeps the camera pointed in the general direction of his subject and even looks through the finder once or twice. As the victim of this mindless assault at last makes good his escape, our seasoned pro holds his camera at arm's length and fires off a final frame. Before he rides a high-speed taxi back to the lab with this great take, he shares with us a little professional wisdom: "You can't buy my instincts, but you can buy my camera." Such an exhibition of instinct lends credence to the old axiom that it's better to be lucky than good. The funny thing about the ad is that it isn't far from the truth.

It brought back a memory, and a somewhat sad one, of a dream shattered almost at inception. As they were for so many of my generation, the mid-'60's were for me a time of searching, of great unrest. Material security seemed only minimally relevant and not always consistent with my own concept of freedom. I moved frequently from city to city about the country. The external journey became a metaphor for the true one. Some of my most serene moments were experienced at 3 a.m. on a Greyhound bus, homeless and jobless but filled with a sense of trust for which I could find no rational basis. Most of my hope for the future lay in words, and much of my joy in photography.

One morning I held in my hands the want-ads of a large-circulation workingman's tabloid, a member paper of a famous publishing empire. It stated on the page before me that there was an opening for copy boys, with the possibility of advancement. A copy boy became a writer or a photographer on that paper about once every ten years. One "boy" had been there for seven years and was beginning to develop conspicuous worry lines. The explanation for this was simple: The competition was elected for life, and modern medical technology was prolonging the agony all around. Nevertheless, I decided to take the job.

What followed for me was an education about newspaper journalism that was comprised of imagery, some of it beautiful and some of it ugly. I should point out that it was a glimpse into modern journalism's traditional roots, for this was a time be-

IN JUST SECONDS

JOE NOVAK

HOW NOT TO BECOME A NEWSPAPER PHOTOGRAPHER

fore computerized typesetting, cybernetic cameras and plastic paper. For this particular paper it was still the green-visor era.

The fleet of paper trucks on dawn patrol would drop their bundles of early-edition bombs—wire-wrapped ten-pounders—onto the curbs, against cigar-store doors and those of the candy shops and delis. WRENCH MURDERER STRIKES AGAIN! Subway faces blinded by ink and pulp would drink up every de-



This is a pretty typical dumb news shot, and I made it. Faye Dunaway was amused when I climbed on her hood. I kept a sharp elbow out for the competition, who did the same for me. Rangefinder camera; exposure: I dunno.

lightly grim detail about the man who carried out what was, in many cases, their own secret desire. For me, it was like being at work before I even got there!

Having distributed copies of the morning edition to the reporters and editors on hand, my first duty was to make a coffee run. Since my shift started about an hour before that of the other copy boys, some of my semiliterate superiors would actually speak to me by name. Later, when things got normally hectic, it would be "Boy!" Each reporter had his own inimitable delivery for that despicable expression. Some would convert the epithet into several syllables to be dragged through the air like a noose; others would simply use the lowest,

meanest voice they could muster.

Another intelligent job we were given was to interleave copy paper with carbon paper. Was *that* fun! Such sandwiches were consumed in great quantity by very old and stately black Remingtons pounded at incredible speed. The reporters doing the pounding wore loosened ties and had eyelids that drooped at the same angle as their cigarettes.

The brightest of the copy boys were sent out with photographers on assignment and trusted to return quickly with exposed film while the photographer remained on the scene or moved elsewhere. Although not the most intelligent, the photographers were the most decent people in the whole business. And to be able to leave the smoky city room with its fluorescent lights, its cranky, bellowing editor, its chattering typewriters and wire-services machines was delightful. Everywhere I went I took along my prize possession, a newly acquired Pentax, my first professional camera. I would learn by observation.

With few exceptions, press photographers hadn't mastered natural light in those days, but some of the more advanced had learned to use the sun as fill light with their strobes. As for good old-fashioned seat-of-your-pants photojournalism, there is one incident that, however anomalous, stands out in my memory. The head of the photo department had preset a photographer's Nikon and warned him that should he change this setting it would be at his peril! For the first time, I understood the meaning of the expression, "press cretin."

At that time, professional cameras didn't have hinged backs. As a Nikon-back holder, I had the satisfaction of knowing that my work was keeping America's photographers from chafing their armpits and possibly deforming their pressure plates. Craft was a matter of conditioning. Day after day a photographer would see his work transformed into a handful of gray dots on pulp. He would see whatever modest tonal scale his photos may have had consistently reduced to a pool of primordial sludge. Eventually he would previsualize his work as primordial sludge and adjust his technique to match.

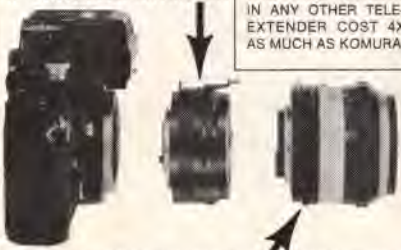
I saw all the great news photographs being made, over and over again—the exhausted fireman, the politician in the smoke-filled room, the hood in handcuffs; I saw Rocky Marciano. In ten months I figured I had seen it all, and got on a bus headed in the general direction of San Francisco. □

KOMURA

KOMURA 7 ELEMENT MULTI-COATED TELE-EXTENDERS MULTIPLY YOUR LENSES' FOCAL LENGTH 2X WHILE MAINTAINING THE SAME PERFORMANCE YOU ARE USED TO GETTING WITH YOUR CAMERA'S LENS ALONE. MADE TO USE WITH NIKON, CANON, PENTAX-K, MINOLTA, OLYMPUS, FUJICA, CONTAX-RTS, ROLLEI, KONICA AUTO REFLEX-TC, NIKON-A1 AND PENTAX-S. ADDITIONAL ADVANTAGE IS THAT THE CLOSEST FOCUSING DISTANCE OF THE COMBINED CONVERTER PLUS PRIME LENS REMAINS THE SAME AS THE MASTER LENS ALONE. ALL ARE METER COUPLED AND AUTOMATIC. KOMURA TELE-EXTENDERS ARE MADE TO THE SAME EXACTING STANDARDS AS THE LENS ON YOUR FINE SLR.

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☐ In 1888 George Eastman introduced his revolutionary roll-film "Kodak" with the promise, "You press the button—we do the rest!" That ingenious bit of copywriting sold millions of cameras, put a Kodak in almost every home, and gave birth to a myth that is as strong today as it was when it began. The myth goes something like this: Anyone who owns a camera can produce a photograph, and the better the camera, the better the picture.

There's no question that part of the myth is true. Anyone who owns a camera and is capable of pushing a button can produce a photograph. It's the second part of the statement—the better the camera, the better the picture—that constitutes the myth. Why? Because in each instance the word "better" should be preceded by the qualifying adverb "technically." The omission implies that two separate aspects of a fine photograph—technique and conception—are synonymous. They're not.

Great photographs are based upon conception and seeing. Technique is used to make these aesthetic aspects visible to others. The better the technique—and, therefore, the instrument used to implement it—the better will be the presentation. But the photographer, not the camera, conceives the photograph. Without conception and seeing, technique has no aesthetic value. Thus, better cameras produce *technically* better photographs, and better photographers use such cameras to produce *aesthetically* better pictures.

Why does the myth continue? Why do so many people continue to believe that concept and technique are identical, rather than interdependent but separate components of fine photography? Perhaps it's because today's advertising still pushes the idea that all you need to become an excellent photographer is excellent equipment. The thrust of such advertising is understandable. Technical excellence is all the manufacturers have to sell. No camera has been or ever will be invented with a viewfinder that flashes "NO" when the composition is wrong or "WAIT" when the pictorial moment isn't right. Such decisions cannot be made by a machine. They must be made by you.

The significance of the photographer's seeing, rather than the camera's recording, is rarely mentioned in an ad. Not that the ads don't fea-

SELF-assignment

BEN HELPRIN

PRESS THE BUTTON—
WE'LL DO THE REST!

ture the work of pros—they do. But their copy implies, at least tacitly if not explicitly, that if you purchase their camera, you'll produce equally exciting photographs. The credit is given to the machine, not the worker. The logic is akin to someone saying that Rembrandt produced great paintings because he used great brushes! It just won't wash.

I'm not damning the photographic industry's advertising. For the most part, and in comparison to that of



Aperture is an elegant magazine that concentrates on the conceptual "whys" rather than the technical "hows" of photography. Yet, after more than 25 years of providing this vital service, the periodical's circulation remains sparse and barely covers the cost of publication. If concept is as important as technique, why must *Aperture* be run on a nonprofit basis? The dilemma is discussed in this column.

many other industries, it's exemplary. Camera manufacturers spend an enormous amount of money on research and quality control, and their equipment will perform technically exactly as they say it will. They may perpetuate the myth that technical and aesthetic perfection are synonymous, but they didn't invent it. Furthermore, if manufacturers bucked that myth, they'd soon go bankrupt. They are simply giving the public what it wants.

The myth is also indirectly perpetuated by the subject content of the leading photographic magazines because most of their articles deal

with technical, rather than conceptual, aspects of photography. Thus, through omission, concept appears to be less important than technique. Why do the magazines use this approach? Again, the answer is economic. The magazine content reflects what the readers want. A publication devoted solely to aesthetics and concept, no matter how excellent, would have too small a readership to be financially profitable.

Fortunately, not all publications have to show a profit. Twenty-five years ago, Minor White, Ansel Adams, Nancy and Beaumont Newhall and other luminaries of the photographic world were concerned with what even then appeared to be an overemphasis on technique. They founded a nonprofit organization to publish a periodical called *Aperture*. It didn't tell you how to use a camera, develop a roll of film, or make a print. In fact, it didn't mention equipment and technique at all!

Aperture continues to provide a showcase for some of the world's finest creative photographers and deals with the "whys" of photography, not the "hows." It's a large (9½ x 11¼-inch), hard-cover, beautifully printed periodical. It's also an expensive one. A year's subscription, which is four issues, since *Aperture* is published quarterly, costs \$28, and the publisher barely breaks even at that. Why? There are two reasons. The first is that it's a sophisticated publication with a correspondingly small circulation. The second has to do with quality. Each issue is printed with loving care on the finest paper available, and the reproductions are as close as you can get to an original print. Considering the quality, the cost per issue is quite low. If you decide to subscribe to the magazine to fulfill this month's assignment, it can be ordered from *Aperture*, Miller-ton, New York 12546. Now for the assignment:

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INTERNEGATIVES BY VERICOLOR

☐ Color internegatives are negatives made directly from color slides, color prints or any colored, flat art. They can be printed on all negative-type color printing papers just like any other kind of color negative. For the darkroom worker already prepared to make color prints from negatives, the internegative process provides a way to make prints from positive color originals still using only one printing setup. No additional printing materials or chemicals are required. And now Kodak has made the internegative process even simpler and more convenient with the introduction of Vericolor Internegative Film 4112 (Estar Base) (SO-412) in sheet sizes and 6011 (SO-406) in long rolls.

It's simpler and more convenient to use because, unlike its Ektacolor predecessor, Vericolor Internegative Film may be processed in regular C-41 chemistry at standard times and temperatures. In fact, it may be intermixed with other films that require C-41 processing. Besides the ease of processing, this new product has the proven Vericolor performance characteristics of very fine grain, high resolution (RMS granularity 5, 4112 and 6011) and high-contrast resolving power (100 lines per mm, 4112 and 6011). This means that an internegative made from Kodak Kodachrome 25 Film the same size as the slide will be as fine-grained and have resolution characteristics as high as the original.

Vericolor internegative films are essentially copy films. The sheet sizes may be exposed with an enlarger or in a sheet-film-type camera set up for copying. The 35mm long-roll size can be loaded in cassettes for use in a 35mm camera to copy slides, larger transparencies or flat art. Instructions provided with the

film assume professional laboratory use, so the exposure and color-balancing recommendations require interpretation to accommodate methods and equipment more appropriate to individual photographers.

The light source used to expose Vericolor Internegative Film should be 3200°K. An enlarger with a color head, a No. 302 enlarging lamp, or a quartz-halogen studio light for use with a camera and slide copier are appropriate light sources. In addition, a trial filter combination of 10M+30Y is recommended to expose the film.

Because no film speed is provided by Kodak, a series of trial exposures is necessary. As a starting point an exposure of ten seconds is suggested with the light level adjusted to read three foot-candles at the exposure plane and the lens aperture stopped down three f-stops thereafter. Any light meter that provides readings in exposure values (EV's) may be used to adjust the light level. Incident meters should be fitted with a flat light-integrator disk rather than the usual spherical type, and a gray card must be used with reflected-type meters.

If an enlarger is used to expose the film, the height (magnification) should be adjusted and the lens focused for the format of the film size being exposed. Without any filters in the light path (except heat-absorbing glass) and the enlarger lens at maximum aperture, read the light level at the enlarger baseboard with the meter set at ASA 125. An incident meter should be set on its back with the light receptacle facing the enlarger lens, or a reflected meter should be used to read the gray card placed on the enlarger baseboard and illuminated by the light from the enlarger. Adjust the light level by stopping down the lens aperture until the meter reads EV 4. Then, either by stopping the lens down three more stops or using

eight times less exposure (one second rather than the ten seconds suggested), you can establish the base exposure for a trial series.

The subject for trial exposures should be an ideally exposed and processed color slide or transparency that contains a gray scale, color patches, possibly a gray card and whatever additional subject references are important to the individual photographer. A standard 35mm color transparency and a standard color negative are available in the Kodak Internegative Test Kit, Catalog Number 120 2019, which, unfortunately, will soon be discontinued. The Kodak Standard Transparency may be used as the subject for the trial exposures and the Standard Negative, which is also available in the Kodak Darkroom Photoguide, as the basis for evaluating the test results.

Begin the test exposures at one-half the base exposure and continue in ½-f-stop increments to include twice the exposure of the base exposure setting. When the exposures are made with an enlarger on sheet film, place the basic filtration recommended in the filter drawer or dial into the color head. Adjust the lens to three f-stops less than the aperture at which an illumination of three foot-candles was attained. Make exposures on separate sheets (or separate parts of a single sheet) at 5, 7, 10, 15 and 20 seconds, then give the film normal C-41 processing.

When a 35mm camera is used with a slide-copying attachment to expose internegative film to color slides, a quartz-halogen light should be set up in front of the camera to provide illumination to the slide carrier of the copier. Adjust the copier and focus the lens for a 1:1 (same size) magnification, set the shutter on "bulb," releasing it and holding it open, and then open the back of the camera. To read the



Making internegatives with the new Kodak Vericolor Internegative films is simple using either standard slide-copying equipment or an enlarger. Once a test is conducted to determine correct exposure and filtration factors matching the film to a particular setup, the setup and procedure can be repeated to consistently make quality internegatives whenever needed.

light level at the exposure plane, use an incident meter with a flat light receptor placed at the film plane. Again, with the meter set at ASA 125, close the lens aperture until the meter reads EV 4. The distance of the light from the camera may require adjustment to bring the light level within the camera lens aperture range. If the aperture is adjusted to an f-stop that is midrange, then a base exposure time of one second can be used.

If an incident meter isn't available, a built-in, through-the-lens camera meter setup with the slide copier may be used. This requires that an average-density slide be placed in the slide copier. Because a slide with the image of an actual subject can be misleading, a test slide is preferable and provides the most accurate transmission of light simulating average slide density. Make the test slide by ideally exposing a gray card so that it fills the entire frame. Neutral-density filters having a total density of 0.75 may also be used. Again, adjust and focus the camera lens for a 1:1 magnification of the exposure test slide and make the reading without color-balancing filtration. Set the camera meter at ASA 125 and adjust the distance be-

tween the light source and the front of the copier until an exposure reading of one second at $f/4$ is achieved. The setting for the base trial exposure would then be one second at $f/11$, the bracketed test exposures would range from $f/8$ to $f/16$, and the trial exposure index would be 12.

To make a trial exposure test, load the camera, place a test-subject slide in the copier, and put the recommended filters in front of the opal glass of the slide carrier. If the aperture setting for three foot-candles at ten seconds was $f/8$, begin bracketing a series of exposures all at one second, starting at $f/5.6$ and making exposures $\frac{1}{2}$ f-stop apart through $f/11$. As with sheet film, the test should be processed normally in C-41 chemistry.

Evaluation of the results is on two levels: for the exposure that produces ideal densities and for negative color balance. For the few photographers who have the use of a color densitometer, a Kodak Three Point Transparency Guide can be used as the test subject with the patches reproduced in the internegative read directly and matched to aim points provided in the film instructions. For most of us a less direct and more involved method of evaluation is re-

quired. This is where the Kodak Standard Negative comes in. Using it as a visual reference, identify the test negative most like it in density. Then take the two negatives, put them side by side in the enlarger negative carrier, and print them together. Make a print by trial and error that produces ideal densities and color balance from the standard negative. With the reproduction of the test internegative in the same print image, differences can be easily measured against the standard negative's ideal densities and color balance. If the two images are identical, no adjustment is needed. Simply identify the exposure level used to make that particular test internegative so that the illumination can be set accordingly in the future.

When printing is done without the aid of a color analyzer, color-print-viewing filters are needed to determine any variance in the color balance of the internegative. If the color of the print image made from the test internegative deviates from the ideally printed standard negative image, look at the two together with the viewing filters over the test internegative print image. When a filter is identified that brings the test internegative image into balance with the standard negative image, the necessary filtration correction has been found. The filter change is the same for exposing internegative film as in making a reversal print directly from a color slide. If, for instance, the internegative image is too magenta (corrected by a green viewing filter), add cyan and yellow to the filtration in equal amounts.

When working with a color analyzer, set it at the program used to make an ideal print from a standard negative. While both negatives are still in the enlarger, read the test internegative and note any differences between it and the readings from the standard negative. Reverse the filtra-

tion changes indicated by the differences from what would be appropriate to correct print color balance. If the correction to make a negative-type print indicates adding yellow, the addition of cyan and magenta to the filtration is called for. Because magenta is the constant in internegative filter packs, subtraction of the yellow filtration achieves the effect of adding cyan and magenta.

After the correctly exposed test internegative is identified and any filtration corrections are established, the exposure level for a normal-density slide to be copied on internegative film can be calculated. Let's say that the test internegative requires twice the exposure of the trial base. The light level can then be adjusted to six foot-candles instead of three. If filter corrections are required, either subtract or add exposure corrections by the same factors that would be required in color printing. These filter exposure factors are provided with the information accompanying color-print-viewing filters. If the camera meter in a slide-copier setup is used to measure the exposure level, the E.I. may be increased or decreased to reflect the basic exposure correction and any filter factor adjustment. If, for example, a $\frac{1}{2}$ -f-stop increase in basic exposure and the addition of filtration with a factor of 1.5 are required, then the E.I. of 12 for the trial base needs to be reduced to E.I. 6.

All exposure settings, final filtration, enlarger magnification and distance of the light source from the copier should be recorded so that identical setups can be made in the future when exposing internegative film. All normal-density slides or transparencies should be exposed at the adjusted level. Dark, underexposed originals may need $\frac{1}{2}$ to one f-stop more exposure; light, overexposed originals will probably require $\frac{1}{4}$ to one f-stop less. □

☐ Most camera clubs have some sort of bulletin to circulate information among members. Bulletins range in complexity of coverage from single sheets to multipaged compendiums. The bulletin has the potential to serve a number of different club needs, but in order to be effective it must be written and edited with care as well as a constant awareness of its intent.

Recognizing the importance of a good bulletin to the smooth functioning of a club and the enriched experience of its members, the Camera Club Committee of the Photographic Society of America (PSA) holds a bulletin contest each year. A club must be affiliated with PSA to participate; entries are accepted in the following divisions: chapter, small club, large club, and council or association. Margaret Estes, full contest chairman since 1974, reports that bulletins are rated on their total presentation and are judged with entries in their division only. As well as point ratings and awards, all participating clubs receive a detailed evaluation of their entry from each of the three judges in their bulletin's division.

The purpose of the contest is both to stimulate the production of high-quality club bulletins (and club activities) and to instruct clubs in how to put together a more interesting, effective bulletin. Interest in the contest is high and always growing; last year's contest drew 286 entries from around the world.

Each participating club is provided with a list of suggestions for what goes into a quality bulletin. But any club, whether or not it is affiliated with PSA or intends to enter the bulletin contest, would be wise to apply these ideas to its own bulletin production. These suggestions are directed toward the clear presentation of meaningful content with optimum utilization of the materials.

The contest entry form emphasizes that the size of the bulletin, its paper quality and printing process have no direct bearing on judging and awards. Rather, the following suggestions are offered to help clubs put together a more effective bulletin:

First, identifying information should be immediately apparent. The bulletin title and club/organization name should jump off the page. The club address; identification with area served; identification with PSA, regional council or other organization; and editor's name and an address to

CLUB CLOSE-UPS

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IDEAS FOR BETTER BULLETINS

contact should also be easily accessible. The bulletin should be organized so that the reader doesn't have to search every page to find what he's looking for. The above information is especially important for the benefit of potential new members.

The bulletin should include the club's calendar of events with any information members will need to prepare for the activity; dates and times for activities should always be given. Future events should be listed far enough in advance so that members can plan ahead; past events should be given adequate coverage. Competition results and notification of upcoming competitions belong in the bulletin. Photographic tips and information are a valuable part of the bulletin because many people can be reached easily. Photo information can come from any club member with something of interest to offer the other members. (Clubs may also want to consider inviting members to write columns for the bulletin, or even having a regular column that rotates among club members from issue to issue.) It is also important to include the copy deadline for the next issue.

The information should be offered not only in the clearest, most concise manner, but with impact, which ensures that it will reach the reader. The presentation should have appeal, which can be accomplished with clarity of organization and graphic effects; it can also be accomplished through humor.

To facilitate a clear, concise presentation, Mrs. Estes suggests, the bulletin editor should see to it that the copy is "clean"—that columns and lines are straight, spelling and punctuation are correct, and typewritten letters are clearcut and of even weight. The print should be large enough to be read easily; and if the bulletin is to be printed on both sides, a paper weight should be chosen that is sufficiently heavy to prevent the print from bleeding through. In regard to page appearance, Mrs. Estes suggests that using two or three columns is usually preferable to running print across the page. Margins on top, bottom and sides of

each sheet should be consistent; space should be neither cluttered nor wasted. Each page should be identified with the volume and number, year and month, and page number.

Mrs. Estes suggests that editors might want to consider typing material in blocks and then arranging these on a board to be photocopied for distribution. This way material can be revised and rearranged easily. The use of art work and photographs doesn't necessarily mean a high rating in the PSA bulletin contest; neither does the use of colored paper. But these visual aids can enhance the effectiveness and the appeal of your bulletin when used wisely.

The bulletin holds a very important position in the camera club. A thoughtlessly executed bulletin adds nothing to the life of the club and runs the risk of going unread; a carefully conceived and produced bulletin can be an integral part of club activity and stimulate the club's vitality. As Margaret Estes says, "The organization bulletin is a history of your group, frequently more useful on a permanent basis than just as secretarial minutes, since it reports on all the activities of the group."

PSA-affiliated clubs receive entry forms and information each year for the bulletin contest. The closing date for the 1979 PSA Camera Club Committee Bulletin Contest is June 15, 1979. If your club is eligible and did not receive a form, or if you would like to know if you're eligible, write Mrs. Margaret Estes, APSA; 2 Ravenna Avenue, Otranto; Charleston Heights, South Carolina 29405. For specific advice (for PSA affiliates) on how to improve your own club's bulletin, or how to start one, Bea Bragg, Bulletin Advisor for the PSA Camera Club Committee, has a wealth of information; her address is 8109 Catalpa, El Paso, Texas 79925.

Of course, if you or your club is interested in participating in this or in any of the many other PSA activities, you can obtain information and/or a membership application by writing PSA Headquarters, Chairman PSA Membership Committee, 2005 Walnut Street, Philadelphia, Pennsylvania 19103. ☐

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☐ This may come as a surprise to some who insist that their filters bear the same brand name as their camera, but chances are, regardless of the name stamped on the filter, it was produced by a huge but relatively unpublicized organization known as Hoya Corporation.

During the interview for this column, Messrs. Chikano and Yasukawa of the Hoya Overseas Advertising Department allowed me a brief peek at the Hoya order books as confirmation. This is a rare favor, by the way, in highly secretive Japan. In these books there appeared the names of almost every major camera manufacturer in Japan, from Asahi Pentax to Canon, Fujica, Nikon, Mamiya and Olympus—right through the alphabet to Zenza Bronica!

At present, Hoya is also engaged in negotiations with the European luminaries Hasselblad, Leitz and Rollei (the German headquarters, not the Singapore branch) for the manufacture of their filters as well. In several of the cases, product approvals have already been obtained, and final negotiations are underway.

Before looking at the product line-up in more detail, let's make a quick review of the history and present organization of Hoya Corporation in order to ascertain the secret of the resounding success of this little-known giant.

The company was originally founded in 1941 for the manufacturing of optical glass for the Japanese military during the war—an arrangement that helped Hoya grow during that initial period. When the war ended, Hoya turned to the manufacture of crystal tableware and chandeliers. Since domestic demand for such luxuries was practically nil, the company depended on exports and sales to the occupation forces in Japan.

The manufacture of optical glass wasn't resumed until 1952, but even so, growth was hampered by an excessively narrow administrative base. By 1960, however, the company really started to move when three affiliates were absorbed and modern administrative techniques were adopted.

In order to ensure future growth, Hoya not only stressed technical innovation but also developed a strong sales system. This company is rather unique in Japan in that it refused to participate in the multiplicative and wasteful wholesale system, one of the major reasons for the excessively high prices prevalent in Japan. Although there was understandably much resistance from the entrenched wholesalers, Hoya underwent many trials and made many sacrifices in or-

FAR EAST JOURNAL CHARLES MARAH

THE HOYA STORY: CREDIT WHERE CREDIT IS DUE

der to uphold their policy of only selling directly to retailers and user industries. This is a system that not only allows for lower prices, but that also permits a sensitive response to customer needs since customer/dealer feedback is of a direct nature. During the worldwide recession at that time, Hoya briefly found it necessary to subsidize the retail outlets, some of which were operating in the red. As soon as the recession ended, however, operations resumed at full speed, and the merits of the direct-sales system were very much in



Included in Hoya's lens line-up are wide-angle, telephoto, zoom and macro-zoom types.

evidence.

The present organization of Hoya includes three divisions: the crystal division, which produces both hand-made and machine-made crystal; the ophthalmic division, which produces eyeglass lenses and frames and various types of machines for that industry; and the optical division, with which we are mainly interested. Besides lenses and filters, this latter division also provides much optical glass for other manufacturers in the industry. For more technical applications this division also produces laser glass, tellurite glass and photomask substrates.

Hoya is also fairly unique among Japanese enterprises in that research and development as well as sales activities of each division are all independent. There is no single facility with company-wide responsibility. This allows a great deal of freedom and flexibility in meeting changing conditions.

Besides research related to glass, which has already resulted in more than 200 types of optical glass, the optical division is also highly concerned with production technology. Of special note here is a nonpolluting, all-electric melting unit utilizing platinum-lined tanks and a direct, automated press instead of hand-operated presses. This technology was recently exported to Poland.

Besides the filters supplied to most of the Japanese camera manufacturers, Hoya's Optical Division also produces nearly 100 percent of the binocular lenses and prisms from Japan, as well as components for telescopes, microscopes and other optical instruments. A recent innovation is the line of interchangeable lenses introduced under the Hoya brand name in 1977 at the PMA show in Chicago.

Backtracking a bit, it is evident that Hoya's widespread success is basically due to the policy of direct sales, which permits lower, more competitive prices, and the innovative research and development activities, which constantly probe beyond known frontiers into uncharted areas to make possible new, more precise techniques.

Before running out of room, let's take a quick look at Hoya's product lineup. Hoya filters, needless to say, appear in almost endless profusion. In addition to the ordinary types, there are numerous special-purpose filters. These include normal polarizing, circular polarizing, and color polarizing filters. Also, multifacet and vario-cross types as well as so-called "spectral-star" filters are in the Hoya lineup. There is also a zoom close-up lens plus infrared and ultraviolet filters for technical applications.

Also of great interest is the lineup of Hoya lenses shown in the accompanying photo. A few minor problems were encountered in the mechanical parts in the initial period, but these have been largely overcome, and popularity is increasing rapidly.

The total of 11 lenses includes four of fixed focal length: a 28mm f/2.8, a 35mm f/2.8, a 135mm f/2.8 and a 200mm f/3.5. The ordinary zooms include a 70-150mm f/3.8 and an 80-200mm f/4. The other zoom lenses feature macro capability, and these are the 25-42mm f/3.5, 35-105mm f/3.5, 70-210mm f/3.8, 100-200mm f/5 and 75-260mm f/4.5. Some of these were only just introduced at the 1978 Photokina exposition. As to the future success of this newly introduced line of lenses, we can only wait and see. But if past performance is any indicator, we will be seeing much more of Hoya. *Sayonara!* □

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☐ When you hear about massive strides in the development of electronic technology, chances are the first things that cross your mind are the real "biggies"—the nuclear controls and guidance systems; the new electronic means for the detection and cure of disease; and the ever-upward movement of computer technology, that mixed blessing of modern man.

However, the same forward strides are being made at other, more practical levels that have a more direct and meaningful effect on our own daily lives.

Take the telephone, for example. The advances now being made in telephone technology are as massive as any of the advances being made elsewhere in technology, and they make our lives easier in all kinds of ways. For instance, in the summer my neighbors and I enjoy sitting on our common lawn, discussing the state of current affairs, deciding the country's foreign policy or what to have for dinner. Then there will be a faint tinkling, and somebody says, "Is that a telephone?" Everybody leaps to his feet, dashes madly to his own home, and it takes a while to gather once again.

Everybody except me.

I have a telephone remote that I simply carry with me and place on the ground at my feet; if my telephone should happen to ring, the remote gives me a "beepity-beep" signal, and I can answer my phone without so much as having to leave my lawn chair. What's more, I can even make calls through my own phone, right from the lawn, and there's not a wire in sight!

What could be more convenient than a push-button dial telephone? I'll tell you what: the new automatic telephone dialers that are so big on the scene today. You program these things by dialing up the numbers called most often and recording them in the dialer. Just select the number, press a button, and put the phone instrument on the cradle. The next thing you hear will be the party you're trying to reach. The unit I particularly like will even remember important dates for me.

But if there's a really big winner in all of these telephone accessories, it's got to be the telephone answering machine. Most of these units permit you to record your own outgoing message, and at first, those of us who had these machines were using very stilted, formal messages, viz: "Hello, this is John Brown. Your call

ELECTRONICALLY YOURS

BYRON G. WELS

YOU CAN STOP WALKING AND START TALKING

is being monitored by an electronic answering machine. At the sound of the tone, you can leave your name, telephone number, and a brief message. Thank you."

O.K. That's the kind of message the instruction booklet recommends. But a few imaginative wags took another direction. One chap has a message that sounds like this: "Hello, this is Count Dracula. At the sound of the tone, you can leave your name, your telephone number,



The Dial-A-Tron Automatic Telephone dialer from Leisurecraft Products, Ltd., is one of the many time-saving telephone devices available today.

and your blood type" (beep).

Another wag announces: "You have reached the Institute for Electronic Music. In a short while we will play our briefest concert for you. Following the concert, you can leave your name and phone number, as well as a brief message, and we'll get back to you later. Now here comes the concert, I hope you enjoy it" (beep).

My own answering machine drives people buggy, for when you call me, this is what you hear: "Congratulations! You have reached the telephone of Byron Wels. In a short while, you will hear one, two, or three electronic tones. If you hear one tone, congratulations again! That means that you're a winner, and can leave your name, telephone number, and a brief message. Now listen, and let's see if you're a winner" (beep).

The telephone answering machines have given rise to an entirely new industry, for mimics all over the country will gladly make a cassette recording, using the voice of any per-

sonality, living or dead, in the field of entertainment, politics, whatever you like. You write the message you want recorded (or they will, if you prefer), and they'll send you back a cassette tape. Play the tape with any cassette recorder into your telephone answering machine, and you can have people like Jimmy Carter, Clark Gable, James Stewart—anybody—answering your telephone!

Incidentally, that telephone remote unit has solved another problem for me too. Used to be that when working in the darkroom, I'd turn the answering machine on and worry later about who called me. But it's a simple matter to carry the remote into the darkroom and thus be able to answer any calls that come in as they arrive.

Another great telephone convenience is the "no-hands" phone amplifier, or Speakerphone. If you get the sort that amplifies both sides of the conversation, you'll find that you can easily go on with whatever you've been doing and not have to hold the telephone instrument. The voice you hear coming out of the speaker sounds like it's right in the room with you, and the party at the other end will hear you perfectly clearly. Just make certain that you get a unit that electronically amplifies both sides of the conversation. Some of the units available use "acoustical" amplification for your own voice, but a piece of plastic is just not as good as electronic amplification.

If you start listening to yourself on the phone, you will soon realize how inefficient most of us are. From the time we say "hello" until we hang up, we're wasting time and money. To get around this, obtain a telephone pickup coil and attach the phone to a small recorder. Simply record all your telephone calls, and then listen to them critically. It won't be long before you begin to use the phone more efficiently and lose patience with those who do not.

That idiotic "hello" does serve a couple of purposes, however. It allows you to tell the caller that you are indeed listening and allows him to adjust to your voice (but in the early days of the telephone, it was not a "hello" that did this—instead, you picked up the phone and you said "Ahoy!").

Take a close look around you at some of the technology that can apply directly to you in your daily life, and you'll find that many of the benefits can be had today, and at more than reasonable cost. □

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SLAVE SOLUTION

Several people had problems with my "Blueprint" article, "How to Build a Slave Trigger" (see PhotoGraphic Magazine, October 1978 issue). I have found that 100 percent of the people who had a problem used the Radio Shack rectifier, and that they all had the same problem: the unit worked without having to be triggered. So if you had this problem, and you used the Radio Shack rectifier, I think you can correct the problem by switching to the General Electric rectifier. If you had a problem, and you did not use the Radio Shack parts, then you might find the following helpful:

When soldering the unit, you must use standard soldering technique, and this includes the use of a heat sink. You can use either a pliers or an alligator clip to hold the metal parts while soldering. This is done to protect the component parts from excess heat. The clip will conduct the heat and prevent this damage. If you had soldered the unit by bending the wires together and soldering them while the unit lay on top of a table or in a vise, etc., you may have melted the silicon in the rectifier. This will cause the circuit to be completed, and the unit will fire every time the strobe recycles.

If you use a strobe that puts out more than 400 volts, it will melt the General Electric rectifier. It appears that the voltage limit for the Radio Shack rectifier is much lower. You can overcome this situation by using a heavy-duty rectifier, which will cost only a few pennies more.

Ray Bright
Pittsburgh, Pennsylvania

GREMLINS AT WORK: DO NOT DISTURB

The December, 1978 issue "Far East Journal: Stitz and Braun—A Promising New Tie-Up" by Charles Marah, page 24, contains misplaced copy in the third column. Beginning 18 lines up from the end, the following 13-line block of type belongs after the first two lines in the last column, and should read, "... (the tripods) feature a patented reversible handle, ... a real boon to lefties ... and the smallest (of the "Shorty" tripods) folds to 8 1/2 inches with a maximum height of 15 1/2 inches ... " Our apologies for the error.—Ed.

THE OUT-ER LIMITS

Due to space limitations, we are forced to dispose of our treasured back copies of Petersen's PhotoGraphic Magazine. They have been an invaluable aid in research, but we are limited to retaining only a two-year supply.

Our back issues consist of a set of 34 copies from October 1973 to December 1976, with a few missing. Any interested reader may contact us for more information.

Paul G. Delman
801 S. Federal Highway, Apt. 1120
Pompano Beach, FL 33062

COPYRIGHT CLARIFICATION

I've been reading and hearing so much about the new copyright law that I dream of being chased by C's surrounded by circles. It's an important and sometimes confusing subject. I liked Markene Kruse-Smith's presentation in "Focus on Filmmaking" ("How the New Copyright Law Affects You," November 1978), but I think one point may be in error.

Markene's column said, "... once your work is published, you risk the loss of copyright unless you make a formal application for copyright registration." I don't think so. It is my understanding that publication will not throw the film into public domain as long as you have placed the copyright notice on the film, or do so within certain time limits. Even if the film has not been registered, the artist still owns the copyright. The disadvantage to not registering the film is that, in case of infringement, the artist will not be able to sue the infringer. Circular R99 from the Copyright Office also states that "... subject to certain exceptions, the remedies of statutory damages and attorney's fees will not be available. ... "

Anyway, Markene pointed out some important facts and clarified many things in her usual fine manner. I always enjoy reading her articles and look forward to "Focus on Filmmaking" each month.

Elinor Stecker
Larchmont, New York

The Copyright Office agrees with you, since the new law specifies that protection begins when the work is created. Keep in mind that there are presently two sets of rules: If your work was completed and published before January 1, 1978, the old law applies; works created after January 1, 1978 are under the jurisdiction of the new law. Unpublished, unregistered work is governed by the new law, which states that copyright protection subsists from creation of the work.—Markene Kruse-Smith

BLUEPRINT SERIES

How To Build a Background Projector



1. In this setup I used a 500-watt No. 2 photoflood, diffused, for main light, and another 500-watt No. 2 photoflood in a bullet reflector for background projector, plus a 200-watt hair light.

BY JOHN E. SCHRADER

PROJECT: To build a simple background projector.

PURPOSE: To make it possible to change portrait backgrounds in seconds and to provide a great variety of backgrounds.

EQUIPMENT: 1. 12 x 12 x 24-inch (approximately) corrugated cardboard box; 2. 18-inch piece of coat-hanger wire; 3. 10½-inch-square Fresnel lens (from Edmund Scientific Company, Barrington, New Jersey 08007, Catalog No. 70,670); 4. paper clips; 5. razor blade; 6.

typing paper.

PROCEDURE: Cut out the front of the cardboard box to make room for the Fresnel lens; cut a hole in the back of the box to make room for the light source (which can be electronic flash or photoflood lamp); and cut out the top of the box to allow the pattern to be projected to be moved back and forth for focusing. The projector configuration is shown in photos No. 2 and 3.

The patterns to be projected are called "cookies" (see photo No. 4). Cookies were

frequently used by movie and television cameramen to add interest to the background. To make a cookie, just draw out a design that appeals to you on a sheet of typing paper, then use a sharp razor blade to cut out the design (see photo No. 5). The cookies are attached to the coat-hanger-wire bracket by paper clips (see photo No. 6).

GENERAL DISCUSSION: The background projector takes the place of the background light in the classically lit portrait. Place the projector to

one side of the subject and aim it at the background wall (which should be white or a light tone for best image contrast), as shown in photo No. 7. The projected pattern can be focused by moving the cookie back and forth between the light source and the Fresnel lens. How much light you pour onto the background is up to you, but usually you will want the background to be at least one stop darker than the subject so that the subject is not overpowered.

I use an electronic flash setup for high-key work. My main light is a 200-watt-second electronic flash bounced from a white umbrella, and an equally powerful unit with a snoot is used for the projector. For low-key portraits I use a diffused, 500-watt No. 2 photoflood for the main light and an equal bulb in a bullet reflector for the background projector.

Be sure to turn off the photoflood in the projector when you are not shooting, to avoid cooking the cookie. You'll want to use barndoors on your main light to shade the background so that the projected image is of sufficient strength. In any case, cover the top of the projector with a piece of cardboard to keep in stray light.

Colored backgrounds can be produced by using colored transparent sheets of plastic glued together to form different patterns. Try gluing the colored plastic over the holes in a cookie for a stained-glass effect. Professionals might use this technique for bridal portraits. For more complicated backgrounds, go to your local art-supply store and get a decoupage kit to lift the surfaces from magazine illustrations. Then transfer these to clear plastic sheets. These can be projected, too. Remember, you won't get totally sharp images, just good, interesting soft-focus backgrounds. Using this background projector can open up an exciting new dimension in studio portraiture for you. □



2. Front view of finished background projector shows locations of Fresnel lens in front, movable "cookie" pattern attached to coat-hanger wire, and light source. In use, top of box is covered with piece of cardboard to keep in stray light.



3. Back view of projector shows placement of light source.



4. Patterns to be projected (called "cookies") can be cut from typing paper (top) or piece of sheet film (bottom left). At bottom right is Fresnel lens for projector.



5. Cookie patterns are cut out using sharp razor blade.



6. Paper clips are used to hold cookies on coat-hanger wire that supports cookies in projector. At right is detail of concentric circles of Fresnel lens.



7. Place projector about eight feet from light-colored background wall. Electronic flash is used as light source here; main light is equal-power unit bounced from white umbrella six feet from subject. Note pattern projected on background.



8. Cookie is focused by sliding it toward or away from the light source. If electronic flash is used as light source, modeling light on flash unit makes it easier to focus the cookie.

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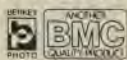
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FEATURES

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SCREENWRITING

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BY MARKENE KRUSE-SMITH

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EXT. LONG SHOT—HOLLYWOOD, CALIFORNIA—DAY

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CUT TO:

EXT. TWO-STORY BUNGALOW IN APARTMENT COURTYARD

A Filipino GARDENER is watering the roses, and we hear the SOUND of typewriter clattering.

CUT TO:

INT. BUNGALOW LIVING ROOM—MED. SHOT—WRITER

A young woman WRITER sits cross-legged in front of a portable typewriter. A thin brown cigar dangles from the corner of her mouth as she types. At the SOUND of a ringing telephone she overturns piles of books, magazines and pillows until she finally uncovers the instrument and puts the receiver to her ear.

WRITER

Hello... Oh, sure, I'm coming along fine with the story.

She removes the cigar for a moment, locates an ashtray for it, and pulls the paper from the typewriter.

WRITER (CONT'D)

Want to hear some of it?

CUT TO:

INT. EDITOR'S OFFICE—PHOTOGRAPHIC MAGAZINE—MED. SHOT—KAREN GELLER—DAY

KAREN

No, Marki, that won't be necessary. But can you have it finished by ten o'clock tomorrow morning? We've got to get it to the typesetter.

She taps her pencil on the desktop, then swivels around in her chair to examine a production schedule that's posted on the wall behind her.

INT. BUNGALOW—CU—WRITER

She clutches her head, her face registering disbelief.

WRITER

(fingering several typed pages) But I'm not nearly finished. Can't it go out Monday?

KAREN

(O.S. TELEPHONE VOICE)

You can do it. A little deadline pressure never killed a writer yet. The time limit may even be good for you.

WRITER

Good like a premature coronary? I can see the headlines now: Movie Editor Mourned. Valiant Journalist Bites the Dust Attempting to Meet Impending Deadline.

INT. OFFICE—CU—KAREN

KAREN

I can't think of a nobler way to go. We'll see you and the story at ten tomorrow morning.

INT. BUNGALOW—MED. SHOT—WRITER

WRITER

Woe is me. (hangs up telephone, then looks at her hands) Fingers, do your stuff.

She inserts a new paper into the typewriter carriage and begins to type furiously.

DISSOLVE TO:

Finished article printed in PhotoGraphic Magazine.

SCREENWRITING

Movie scripts or screenplays can be written in many styles to serve various purposes. Some filmmakers merely make notes to serve as a memory aid. Others write a brief story treatment explaining the movie's concept, describing the visual images and summarizing the action. People planning sponsored films, feature films or projects they're trying to get financial support for need to have a very complete script to show to clients and potential investors. The shooting script serves as a blueprint for constructing a film.

Even abstract, experimental forays and *cinéma vérité* projects—genres that depend on fortuitous accidents and unexpected discoveries—should be carefully planned before any film is run through the camera. Obviously, when making a documentary film, you can't anticipate what everybody's going to say or exactly what will happen during an event. But you can begin with a clear idea of what you want to show on film.

French director Francois Truffaut has said that clarity is the most important quality in the making of a film. Whatever is *said* instead of being *shown* is lost upon the viewer. When information given the viewer becomes obscure or incomprehensible, it is because the director's intentions were vague to begin with or he lacked the competence to convey them clearly, says Truffaut.

Suspense master Alfred Hitchcock scripts action to the smallest detail before the shooting begins. He draws rough sketches showing how each camera angle will be used to progress the story. In fact, Hitchcock regards film writing and planning as the most creative moviemaking processes; the actual shooting is merely a mechanical necessity.

But the place to begin is not with elaborate sketches or professional screenplays. Film planning must begin with an *idea*. Movie ideas are not hard to come by. You probably have plenty of them right now. Just think of the possibilities—travel, adventure, comedy, drama, animated forms and characters, situations to document, techniques to explore. You could film for the rest of your life and never begin to use them all up. Perhaps that's part of the problem. There are so many subjects to choose from that we're perpetually tempted to pursue a little of each idea all at once rather than developing our mental pictures one at a time.



Keep a journal or small notebook to record ideas. If a sudden flash of insight occurs just before you drift off to sleep, get up and write it down before you forget.

CONCEPT

The trouble with many amateur films is that they lack a definite concept. When the filmmaker is not exactly sure what he/she wants to express, finding the proper images for expression becomes impossible. The solution is to write out the concept in a narrative or story form, then translate this into a shooting script or a storyboard.

Of course, you can't completely envision a film before you work on it, and even if you can, it never turns out exactly the way you planned. For many of us film is an art form in which the substance only gradually reveals itself. We enjoy this element of progressive growth and gradual revelation. All the same, though, the loftiest cinematic intentions can easily wind up an amorphous mass of cellulose acetate strands unless some time is taken to plan the movie before the footage is exposed and processed.

Preproduction planning can take two forms. A *written* version of the action—a treatment, screenplay or finished shooting script—helps to clarify the film concept and show what actors, props, locations and camera angles will be necessary to carry it out. A *drawn* version—a storyboard or a series of index cards or panels representing the various shots you plan to film—will indicate the rough composition of each shot and provide instructions for filming. It is not necessary to be able to write like Fitzgerald or to paint like Picasso in order to create a good screenplay or storyboard. As a matter of fact, F. Scott Fitzgerald's years in Hollywood produced no really memorable screenplays, and Pablo Picasso never ventured into filmmaking.

TREATMENT

A treatment summarizes the action and suggests some of the visual images you plan to film. It is written in a

AMY'S FIVE YEARS OLD TODAY

1. CU Amy holding up five fingers, "I'm five years old."
2. CU of calendar month and year, PAN to:
3. CU of date circled on calendar, with "Amy's Birthday" written in red marking pen
4. Shots of Amy's friends arriving with their parents
5. MED. SHOT of party table with Amy and her friends cheering as birthday cake and ice cream are brought in
6. CU Amy blowing out candles
7. CU Mother cutting cake
8. Shots of kids eating, playing kazoes, blowing party horns, etc.
9. MED. SHOT Amy opening presents, kids' reactions
10. Shots of kids playing party games
11. Shots of parents watching
12. Children waving goodbye, Amy's guests leaving
13. Amy playing with a favorite present
14. After-party debris

The shooting script for a home movie might consist of a simple shot list, since such a film probably won't require a lot of dialogue or complicated stage directions.

WRONG

And so, they fall in love and live happily ever after.

FADE OUT

RIGHT

He holds her in his arms; his lips gently brush hers.

RUDOLPH

Darling, be mine forever; say you will.

PENELOPE

Oh, I could never leave you, Rudy.

FADE OUT

Think visually, and don't put anything in the script that you can't film. Exposition should be kept to a minimum. Instead of merely describing feelings and situations, show the action and let characters tell each other how they feel.

narrative story form. The purpose of the treatment is to help the filmmaker to visualize the story in images that transmit the movie idea as clearly as possible.

Write out the main idea in a few sentences. Who are the main characters? What events or situations do you plan to film? Plan a beginning, middle and end for the film, including sounds the viewer will hear as well as images he/she will see. The treatment should



Check libraries for source books and magazines, then contact authors of books and articles for additional leads and approaches. Instructional films, particularly, demand factual information and an interesting perspective.

be brief. Dialogue and specific camera directions are not needed, since the main purpose for writing a treatment is to help you to focus your thinking about the concept and to permit you to move on toward the next stage in scripting. The treatment merely outlines the movie; actual filming instructions will be worked out in the screenplay.

SCREENPLAY

When the treatment is completed, you're ready to state in specific terms exactly what is going to occur in the film. While the treatment provides a synopsis of events, the screenplay includes a precise description of the action—all the dialogue, sound effects and descriptions of locations are planned on paper. The screenplay also describes each shot with instructions showing the general point of view of the camera (close-ups, reverse angles, pans, etc.) and indicates where transitions (cuts, fades and dissolves) will occur between shots and scenes.

Despite the cinematic annotations

Dry Lips?



If you have dry lips or sore lips, you need Blistex, the medicated ointment in the tube. Blistex soothes and softens cracked, chapped lips, no matter what makes your lips that way! It's also great to help heal fever blisters and cold sores.

**Blistex -
The lip soother**

SCREENWRITING

necessary to describe the movie's action, a script reads much like any other printed form of dramatic literature, but the ability to write a good one requires a strong consciousness of visual possibilities. When writing a screenplay, you should try to visualize exactly what is to occur in front of the camera and how each shot will be filmed.

A somewhat archaic term for the screenplay is "scenario." In the silent movie era scenarists like Anita Loos first plotted out the action, then, after the film was edited into a rough assembly, wrote lines for the title cards with notations showing where the cards would be inserted to suggest dialogue and to embellish the story. Today the term is sometimes used as a synonym for "shooting script."

The shooting script includes extensive technical details regarding the film's setting, camera work and other factors. Scenes in the shooting script may be arranged in the order in which they will be shot rather than the order in which they will be seen on screen. This is so that all the scenes involving the same actors and sets can be shot at the same time for the sake of economy. When the film comes back from the lab, it is rearranged into its proper order according to the screenplay.

INFORMAL SCRIPTS

While elaborate productions require very detailed shooting scripts, more personal films may be made with scribbled jottings instead of a formal, written script. Directors work with scripts in many different ways. D. W. Griffith and several other early directors worked virtually without a script; we've already mentioned Hitchcock's antithetical views on the matter. Exponents of *cinéma vérité* (literally, "cinema truth"), a French movement of the 1960's, produced movies by first tape-recording interviews, conversations and opinions; then they shot visual images to correspond with the words and finally created the film in the editing room.

Since home movies usually don't require dialogue or complex stage directions, the shooting script need not be as thorough as a script needed for other types of films. A simple shot list would probably suffice. (See illustration.) Here, it's possible to use only brief descriptions of the shots you intend to take, with some indications of approximate camera angles and points of view. The list should be planned to include a beginning, middle and end so the movie tells a story with good conti-

CLOWNING AROUND

PICTURE

1. MS—Herbert Hoover in clown costume. He extends both hands toward camera to magically produce the title, "Clowning Around," on screen.
2. MCU—Rosie Hoover, in costume, seated in front of stage mirror applying make-up.
3. MCU—Herbert Hoover applying make-up, also reflected in mirror in over-the-shoulder shot exactly like shot of Rosie.
4. MS—Ringmaster blowing whistle to introduce the clowns.

SOUND

- Drum roll, increasing in speed until clash of cymbal when title appears.
- Old-fashioned steam calliope music, "Oh You Beautiful Babe."
- Calliope music continues.
- Ringmaster: "Ladies and gentlemen, our very own circus clowns Herbert and Rosie Hoover."

In this form of movie script, shot descriptions are listed under the "Picture" heading on the left side of the page, with notations for music, dialogue, narration and effects listed on the right under "Sound."



Equipment requirements for screenwriting are minimal. You'll need pens, pencils and paper for making notes; index cards for planning shots; and a typewriter for pecking out the final draft.

nity. Such foresight will elevate the film from a hodgepodge of moving snapshots to an interesting family record.

More advanced projects really ought to have a detailed shooting script. While this might seem to involve loads of work for an amateur film, you'll find that the scripting stage of planning makes the entire job easier. Also, it's likely to save a lot of film. Filming from a good script becomes a matter of telling your crew, "This is what we're going to film next," instead of having everybody ask, "How are we going to film this scene?"

HOW TO STRUCTURE

Screenplays shouldn't meander aimlessly. You need to write a strong beginning, a well-rounded middle and a definite ending into the work. The action should climax at least once in the middle.

First impressions count, so start out strong. Industrial films often state the objective of the movie in the first 30

seconds. Once viewers know the purpose of the film, they'll be attuned to the information that's presented. In instructional films it's especially important to keep in mind the film's objective and its intended audience.

If people like what they see in the beginning, they'll be more likely to enjoy what follows. You could begin in the midst of some exciting action or use startling cinematography, unusual locations, intriguing characters or fascinating situations to involve your audience. The opening scenes should give an inkling of good things to come.

Don't get bogged down in the middle. All of the action in a fictional film or a dramatic documentary should build to the climax. The characters in a dramatic film must want something; the story should show how they try to get it. Film each scene to progress toward the climax, but vary the pace from scene to scene. The film shouldn't be too predictable, nor do you want to get too far off the track. Remember to show events; don't just tell about them.

The ending should be simple and clear. This is what your whole movie has been leading up to, so it's important to make it worth the effort. Moviegoers often cling tenaciously to their first impressions all the way through a film; then, when the lights go on, they'll judge it according to whether or not they liked the ending. Movies without definite endings are like jokes without punch lines—they leave the audience confused or disappointed.

TRICKS OF THE TRADE

Don't tell anybody all the details of your movie idea until the whole story's safely down on paper. It's not so much that anybody would try to steal the concept, but you might accidentally

MOVIE LINGO

Every field develops its own special jargon, and filmmaking is no exception. With a working knowledge of the terminology of screenwriting, you'll be able to present ideas as clear, concise instructions that can be easily understood by anyone in the motion picture industry.

Ideally, scripts should describe the visuals, shot by shot, and provide the following information: whether EXTERIOR (EXT.) or INTERIOR (INT.), location, time of day (DAY or NIGHT), camera setup, subject, action that will take place, shot transitions (if other than straight cuts) and audio instructions.

Camera Setups

CLOSE-UP (CU)—A close view of an object or some detail in a scene. In the case of human subjects, the head only. (MEDIUM CLOSE-UP is abbreviated MCU.)

MEDIUM SHOT (MS)—A shot of a subject by itself, with only incidental background.

LONG SHOT (LS)—A full view of the subject used to reveal more detail or background in the scene. Often used as an orientation or establishing shot.

Camera Movements

PAN—An abbreviation of panorama, to rotate the camera horizontally.

TILT—Vertical camera movement, as in TILT-UP or TILT-DOWN.

DOLLY—Moving the camera forward, sideways or backwards, using a dolly, or camera support on wheels.

ZOOM—Operating the camera's zoom lens to bring the subject nearer or farther, as in ZOOM-IN or ZOOM-OUT.

Transitions and Special Effects

FADE—The gradual darkening of a scene until the screen becomes black (FADE OUT) or the transition from a black screen to a normal picture (FADE-IN). Every film opens with FADE-IN and closes with FADE-OUT. Between, fades sometimes act as punctuation, separating major segments of a film.

DISSOLVE—The merging of one scene into the next. This is accomplished by superimposing a fade-in over a fade-out so that one shot replaces the other. It's often used to show the passing of time between sequences.

INSERT—A shot, usually an extreme close-up, of some object or detail which can be filmed out of sequence and cut into the picture during editing.

POINT OF VIEW (POV)—A shot used to present the view of a particular character. The camera's position approximates that of the character, and the audience sees what the character would have seen.

Sound Instructions

OFF-SCREEN (O.S.)—Sound is coming from someone off-screen, while the camera is focused on someone or something else.

VOICE-OVER (V.O.)—Voice, song or narration heard over the action on screen. For example, we may hear a letter being read aloud, but we do not see either the letter or the person reading it; instead we may see a funeral ceremony in another place and time, which has a direct bearing on what is heard.

MUSIC OUT or MUSIC IN—Sound fades; the same as FADE-OUT MUSIC or FADE-IN MUSIC.

take the wind out of your own sails. By describing the movie to somebody while it's still in the idea stage, you'll prematurely satisfy the creative impulse that motivates you to make movies in the first place. It takes discipline to direct the internal drive that makes you want to communicate ideas. The first step is to get your ideas down on paper so that they can be translated to film. Great ideas for a film are a dime a dozen; great scripts and films are a lot harder to come by. How many times have you heard people talking about what they're going to do someday? After too much *talking*, there's re-

ally no reason to *do* a project, since you've already been through the whole experience in your mind and shared it with friends.

The other reason for writing down your ideas before telling others about them is that they tend to fade away. The most vivid mental images are more fleeting than you think. Precious gifts from the filmic muse are seldom repeated scene-by-scene after the initial inspiration. Monday's scintillating revelation may be lost by Wednesday unless, of course, you write it down.

Dialogue won't be hard to write if you listen to the way people talk. Stilt-

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SCREENWRITING

ed, formal speeches could explain what's going on in the movie, but characters saddled with long expository lines are more likely to sound like a Greek chorus than real people. People don't always talk in complete sentences. A good test of written dialogue is to read the lines out loud after you've written them down. Lines that don't sound natural should be cut or changed. Dialogue should never leave the viewer bewildered, or worse, indifferent to the procedures on the screen.

RESEARCH

If your movie deals with a subject that needs to be researched, all the information the film is going to present must be systematically gathered together and checked for accuracy. Useful sources of information may include books, trade publications, magazine articles and experts in the area you're researching. Whenever possible, locations can be visited, people you'll be working with should be contacted, and camera angles planned.

Technical subjects may require mastering techniques and principles in order to be able to understand the processes that need to be shown on screen and points needing special emphasis. By going to a library and reading through article headings, you'll quickly get a feeling for your subject. Most companies staff public relations departments where you'll be able to read press releases and news clippings on company activities. Talking to P.R. people, even over the telephone, can give you a broad outline of key issues and information in the field you're studying.

Your reading of factual material will be easier and more efficient once you've got a feeling for the subject and can see where your film will fit into the scheme of things. Write down key points to be made and try to think of visual ways to interpret these issues. Then put the points in some sort of order. Continually ask yourself questions viewers will probably ask, extending your research to include the answers. Keep in mind that explanations should be *visual* rather than *verbal* whenever possible. Even very dry, factual material can be illustrated with interesting live-action sequences or graphic shots.

PLANNING CARDS AND OTHER FORMS

Some filmmakers plan shots on 3×5-inch index cards, numbering the cards in the order in which they'll ap-

pear in the film. Each card describes the action that will take place on screen during one camera take and any other information necessary to film the segment. Quick sketches indicating camera angles are often included, but the cards can really be as elaborate or simple as you want to make them. Their purpose is to make sure every shot necessary to the movie gets filmed so you won't end up missing shots when you begin to edit.

After the cards are numbered in their screen order, they should be arranged in the most convenient shooting order. Make a list of this arrangement, indicating each card's position in the shooting schedule, so the list can be used as a shooting guide. Each card is checked off the list as it is filmed, then cards are rearranged into proper order to aid in editing.

Yet another way to organize the film is by drawing a vertical line down the center of a piece of paper and listing visual images in a column on the left side of the page and sounds in a column on the right. This method has the advantage of enabling you to quickly skim down the list in order to determine exactly what's needed for each scene.

No matter how you elect to plan the paper version of your movie, when the script is finished you'll have a good idea of what needs to be filmed and how you intend to shoot each scene. The rest of the preproduction process includes preparing a budget; gathering and checking equipment, props and materials; finding locations where scripted scenes can be filmed; casting actors; recruiting crew members, and arranging the shooting schedule.

But you've already built the foundation. Of all the steps involved in filmmaking, writing is one of the most important, because everything else you do will be the result of what you plan on paper. Author and independent filmmaker Lenny Lipton says that in his view a filmmaker writing a script is like a novelist filming an outline of a projected novel. But Alfred Hitchcock compares a filmmaker who's shooting off the cuff, making things up as he or she goes along, to a composer attempting to compose an entire symphony before an expectant orchestra. "I like to improvise in an office," Hitchcock says, "not on a stage in front of a hundred technicians." Whatever your feelings about writing, if your purpose is clear and you plan the film with a specific audience in mind, you'll be ahead in the game. □

On Owning This Hasselblad Flight Bag Without Paying For It

It is a bag that has been especially made for Hasselblad in Sweden.

It is fabricated from a smooth, closely woven canvas, in a medium blue, with the Hasselblad name emblazoned on both sides.

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HASSELBLAD®



On Photographing a Monster

It hates being photographed. It glares balefully at the camera. It sulks, fidgets, pouts.

It is that most fearsome of creatures, a perfectly normal four-year-old child.



The photographer, wise in the ways of distracting difficult subjects, abandons his camera. He wanders about the studio, talking and gesturing. The monster, no longer feeling threatened by the evil eye of the lens, relaxes and becomes once more the sweet child its mother knows.

From time to time, the eye of the camera blinks. There is a quiet whirring of an electric motor, and the camera blinks again. Yet the photographer is nowhere near it.

An Ingenious Little Dial.

The camera is a Hasselblad, the motor-drive 500EL/M.

A dial on the camera is set at "SR." This prereleases the entire reflex system. At the end of a 20-foot extension cord, the photographer holds a release mechanism. When triggered, it operates the leaf shutter without a moment's delay, thus reducing the risk of "eye blink" from the subject and delivering a higher number of useable photographs.

There are four other settings on this dial: Single-frame in the normal mode. Continuous, automatic firing for as long as the release is held down. A single frame in the prereleased, speeded-up mode for one frame only. And continuous, automatic firing in the speeded-up mode at the rate of one frame every 8/10th of a second.

Hasselblad Versus 35mm.

Why is this photographer not using one of the many excellent motor-drive 35's for this assignment?

One compelling reason might be the size of the Hasselblad negative. Each is 2 1/4 inches square, almost four times the area of a 35mm frame. (See box, below right, for actual size.)

To make an 11 x 14 print of the child, one would have to enlarge a 35mm negative 11.6 times. A comparable Hasselblad print requires only a 7-times enlargement. The ability to hold contrast is phenomenal.

Then there is the camera's leaf shutter. Unlike the shutter of a 35mm camera, it is fully synchronized for every type of flash at every speed up to 1/500th of a second.

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BLACK-AND-WHITE PAPER PRIMER

SHEDDING LIGHT ON ENLARGING PAPERS

BY ELISSA RABELLINO AND CHARLENE MARMER SOLOMON

You've put much effort into composing just the exact image you want. You've given a lot of thought to the exposure, lighting, point of view. Your negative is a good one. Now comes the question of how to best present that image—how to print it.

You may want to depict your subject as realistically as possible, or you may want a bold or imaginative variation of reality. Whatever the desired effect, in order to choose wisely you need to know the basics about enlarging papers: how they function and what each type offers you.

There is a vast selection of photographic enlarging papers to choose from, so to help you we offer in this article (and reference chart) basic information in the following areas: how photographic papers work, what each paper characteristic means to the dark-room worker, how to handle and store paper, and finally, how to choose the appropriate paper for your needs.

HOW PAPER WORKS

Photographic enlarging paper, like film and other photographic materials, functions in the following way: A support, or *base* (in this case, paper stock), is coated with a light-sensitive *emulsion* consisting of minute crystals of a silver halide (usually some combination of silver bromide with lesser amounts of silver chloride and silver iodide) suspended in gelatin. The composition of this emulsion determines the *image tone*, which ranges from blue-black to brown-black.

When you expose this photosensitive material to light (whether it's film in the camera or printing paper under the enlarger), a *latent image*, one which is later made visible by development, is formed by the action of light upon the silver crystals in the emulsion. The de-

veloper frees exposed silver from its compound and deposits it as tiny grains of black metallic silver. When you use a fixer, or "hypo," the remaining, undeveloped silver halides are made soluble and are removed, along with excess fixer, by washing.

Thus the latent image is made visible when you develop the paper. What we see as solid tonal areas are actually irregularly shaped clumps—*grains*—of black metallic silver in varying *densities* or degrees of concentration.

PAPER CHARACTERISTICS

All of the characteristics of photographic enlarging paper interact to make each type of paper distinctive. It's important to understand these qualities before you can choose a paper wisely:

Paper speed designations—slow, medium and fast—refer to the paper's sensitivity to light and the subsequent amount of time it requires to produce an image. Fast or "high-speed" papers are the most sensitive.

Much of the quality of a paper's performance is centered around its *contrast* characteristics. *The Focal Encyclopedia of Photography* defines contrast as "the difference in visual brilliance between one part of the image and another." Papers that produce an image that has few tones between black and white with great apparent difference between them, as well as deep black shadow areas and brilliant white highlight areas, are called *contrasty* or *hard*. On the other hand, *soft* papers produce images with subtle tonal gradations and no strong whites or blacks. The total span between the lightest and darkest image areas of a paper is called its *brightness range*.

Enlarging papers are available in a full range of contrasts, from extra soft

to extra hard, in two forms—*graded-contrast* papers and *variable-contrast* papers. Graded-contrast papers are usually designated as Nos. 0 or 1 (softest) through No. 5 (hardest). Variable-contrast papers, on the other hand, are used in conjunction with colored filters that enable you to obtain, with one package of paper, a range of contrasts equivalent to the graded-contrast range. This is possible because of the different *color sensitivities* of different types of emulsions. Most paper emulsions are sensitive only to the ultraviolet/blue end of the spectrum, but a few, including variable-contrast papers, have green-sensitive emulsions. (An exception is Kodak's Panalure, which has a panchromatic emulsion—sensitive to all colors—making it especially suitable for printing color negatives.) These emulsions have a different color sensitivity from the blue-sensitive emulsions. Variable-contrast papers have two different emulsions, one on top of the other or intermingled; one is blue-sensitive and hard, the other is yellow-green-sensitive and soft (though these characteristics are sometimes reversed). The colored variable-contrast filters are placed in the enlarger light path, during printing, to effect varying degrees of contrast, depending on their color. When no filter is used, the paper's inherent contrast usually corresponds to grade No. 2 or "normal."

Theoretically, all enlarging papers are graded in accordance with ASA testing procedures. However, because there are permissible tolerances in these procedures, one manufacturer's grade No. 2 may not be equivalent to another manufacturer's grade No. 2. Select one brand and stay with it—that way you'll avoid surprises.





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can add either the 2-fps Winder MX or the 5-fps Motor Drive MX, and the whole system will still weigh less than other SLRs *without* a winder or a drive unit.

THE PANORAMIC VIEWFINDER

The image in the viewfinder is so big and bright it snaps right into focus regardless of lighting conditions. Inside the finder you'll see aperture setting, shutter speed, and the two adjacent shutter speeds.

You'll also see our incredible five-dot LED exposure readout. When the green dot in the center is lit, you have perfect exposure. When one of the two yellow dots is lit, you're a half stop under- or over-exposed. And when one of the two red lights is on, you're a full stop (or more) over or under. With all that information right in the viewfinder,





you can work easily without having to move the camera away from your eye. And the solid-state LEDs are rugged. You can't jar them out of alignment, as you might with many matched needle systems.

GPDs—A BETTER WAY TO METER LIGHT

The light sensors in the MX are a major technological breakthrough in themselves, developed by Pentax in cooperation with Nippon Electric. They're called Gallium Arsenide Phosphide Photo Diodes, or GPDs. They react 1,000 times faster than CdS cells in low light situations, and they respond instantly to any radical light change, no matter how rapid. And yet, unlike SPD cells, GPDs are virtually immune to infrared light. In the future, you'll probably see GPDs in most other SLRs. At Pentax, we use them right now.



COMPACT LENSES

A lot of SLRs have been made smaller lately, but unfortunately, their lenses haven't. Pentax decided to design 18 ultra-thin, ultra-light M-series lenses for use on the MX. Of course, our regular Pentax lenses also fit the MX. So there are over 40 interchangeable Pentax lenses available, from 1,000mm telephoto to 17mm fisheye. All have the Pentax bayonet mount, which is becoming the standard of the industry. And all have Super-Multi-Coating, a process we invented and perfected.

MORE INNOVATIONS

Loading the MX is a real treat. Our "Magic Needle" takeup



spool is probably the most efficient loading system you've ever used.

Also, we make nine interchangeable focusing screens which can be changed in seconds.

MOTOR DRIVE MX

When attached to your Pentax MX, the Motor Drive MX lets you fire off consecutive exposures at up to 5fps. And it's available with three different power sources.

DATA BACKS AND 250 EXPOSURE BACK

The back of the MX accepts the Pentax Bulk Film Magazine and data back. If you have a lot to shoot, the Bulk Film Magazine holds 250 frames. With the Dial Data MX, your MX becomes a data camera. On each exposure, your choice of alpha/numeric data is imprinted automatically. And our Data MX camera comes complete with a built-in clock, so you can imprint the time, date and more on each frame.

All in all, the Pentax MX is a formidable camera, the heart of a superb, sophisticated, professional system. It's the result of years of meticulous research and exhaustive testing. We wouldn't have it any other way. And we don't think you would either.

For more information, write: Pentax MX, P.O. Box 2585, Littleton, CO 80161

PENTAX®

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The Vivitar VI™ Enlarger System With The Vivitar Dioptic™ Light Source.

*Classical optical bench engineering and the
use of a new light transmission device
makes possible an advanced technology enlarger system.*

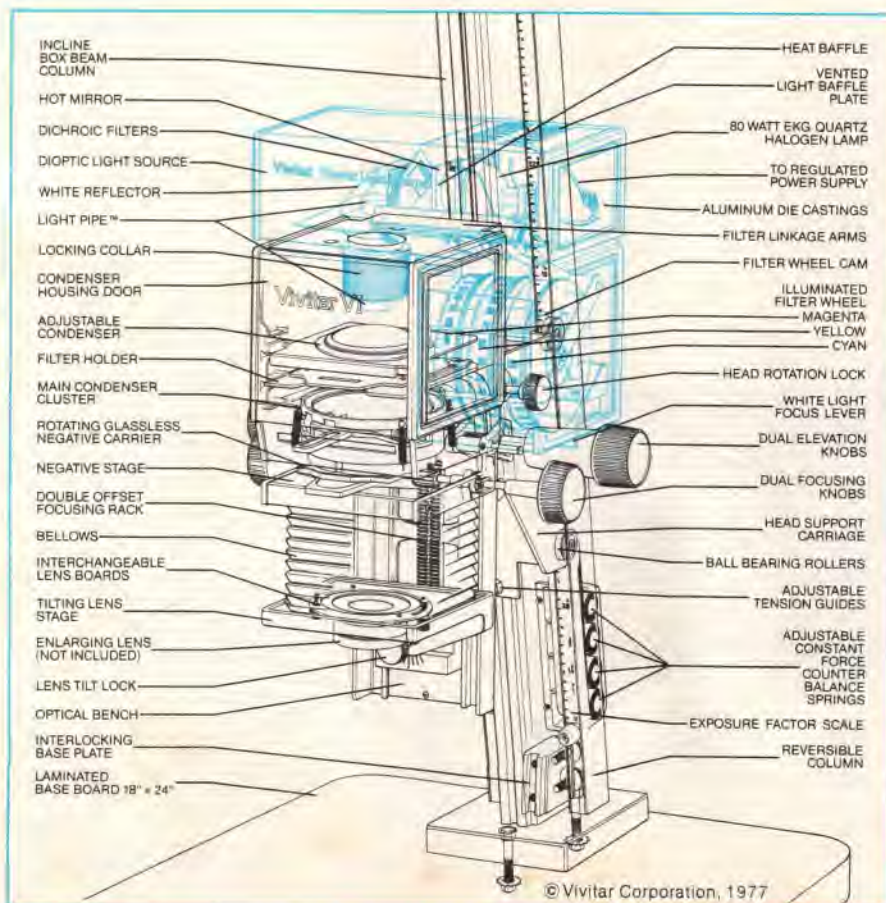
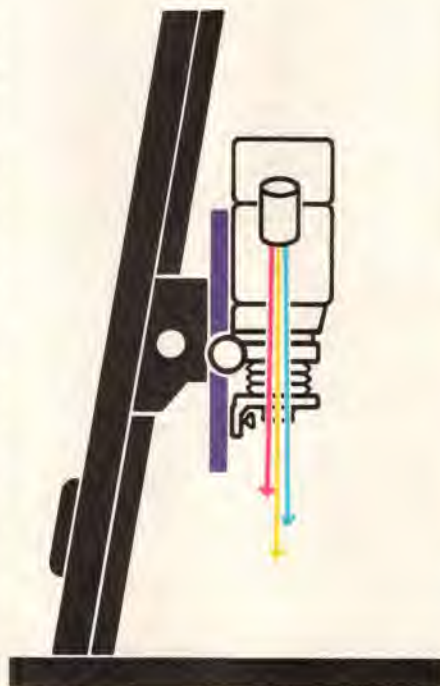
Vivitar has re-engineered the enlarger. Virtually every segment of typical enlarger construction was examined, re-thought, and refined. And in two especially important areas Vivitar designers have made major breakthroughs.

The basic Vivitar VI™ is a black and white enlarger with all critical components from the light source to the lens stage secured to an optical bench. Everything moves on a massive, rigid column thus assuring precise alignment to the baseboard.

To transform to a precise color enlarger system, the designers invented the Amazing Light Pipe™* a rod of special acrylic material in a solid cylindrical mass, replacing the conventional integrating box. It mixes and transmits light without heat and without significant light loss. The Light Pipe is unique to the Vivitar Dioptic™ Light Source.

The massive, rigid column and extra-large baseboard (18" by 24" prints from 35mm are standard) enhance the professional appearance of this new enlarger system.

*Patent Pending



For more information on the Vivitar VI Enlarger and Vivitar Dioptic Light Source for black and white and/or color printing, please write to Vivitar, Dept. 73.

Better still, see a Vivitar dealer for a demonstration. The more experience you have with other enlargers, the more impressed you will be with this new-generation enlarger system.

Vivitar Corporation, 1630 Stewart Street, Santa Monica, CA 90406.

In Canada: Vivitar Canada Ltd./Ltée

Vivitar®

PAPER PRIMER

The emulsions of most black-and-white printing papers, with the exception of silver-chloride contact papers, are made up of silver bromide with smaller amounts of silver chloride and sometimes a trace of silver iodide. Papers that are primarily silver bromide are the most sensitive to light and have a neutral-black image tone. Papers with large amounts of silver chloride have warmer image tones, depending on the amount of silver chloride in the emulsion, and are not quite as fast as bromide papers. With special development some chlorobromide papers can be made to produce brownish and even sepia image tones.

Whatever the emulsion, it must rest on a supportive base that can withstand the continual immersion in liquids that occurs in paper processing. For black-and-white papers there are two kinds of bases—fiber and resin-coated. The fiber base, which is sometimes called "baryta" base or "conventional" base, has a broad range of tones and surface textures from which to choose. Fiber-base papers require considerable washing and drying time since the fibers soak up large amounts of chemicals and water.

Resin-coated papers have a resin, or plastic, coating on the base, which makes the paper water-resistant and thus requiring much shorter fix, wash and dry times than fiber-base papers. Resin-coated papers can be air-dried quickly without curling. However, they're available in fewer different surface textures and have narrower tonal ranges as well as a greater susceptibility to surface damage. You must also be careful not to fix or wash them too long, as this can result in a reduction of the tonal range as well as emulsion damage.

The *base tint* refers to the color of the paper stock used for the base. For example, white-base papers are available in tints from cold white to cream or ivory. Some manufacturers increase the brightness of the base tint by using fluorescent dyes. Warmer-toned paper bases, such as cream or ivory, reflect less light and therefore have a shorter visual tonal range. (Luminous Photo Corporation has a full line of papers with pastel-colored base tints in many colors.)

The *weight* of a paper indicates its thickness. There are lightweight, single-weight, medium-weight and double-weight papers. Resin-coated papers are available almost exclusively



PHOTOS BY ALAN M. SOLOMON.



1-4. These photos show the progression in contrast grades from No. 1 through No. 4. Photo No. 1 was printed on contrast grade No. 1 paper, photo No. 2 on grade No. 2 paper, etc.

in medium weight.

There are a wide variety of *surfaces* to choose from, ranging in reflectance value from glossy and semigloss to semimatte and matte. The textures vary from smooth to pebbly or fabriclike. Since glossy papers reflect more light than matte or rough-surfaced papers, they reproduce the greatest negative tonal range and have higher apparent contrast than papers whose surface is rough and scatters light. The accompanying chart will give you a complete list of the various surfaces available.

CHOOSING A PAPER

Your negative and what you want to do with it will dictate your choice of paper. You should consider the follow-

ing when making your decision: paper size, contrast grade, surface, tone, weight and speed. For beginning printers, it's a good idea to start with an easily available normal-contrast paper with a glossy surface in an 8×10 size. Stay with one type of paper until you are very familiar with it, then expand into different contrasts, textures and tones. When you do this, take into consideration what types of subjects you're likely to photograph and your particular operating conditions, then consider the following factors:

Contrast—Probably the most important factor in choosing an enlarging paper is contrast. A print's contrast has been partially determined, even before it goes under the enlarger, by the negative's contrast. Careful selection of contrast grade can correct

When Eadweard Muybridge began photographing people in motion,



In 1887, when Eadweard Muybridge produced the first of his monumental studies of human and animal locomotion,

Kodak was already marketing photographic chemicals. Our first catalog, published the previous year, lists a Concentrated Improved Developer for use with glass or paper negatives—the first of a long line of product improvements and innovations spanning nearly a century.



In the early 1930s, we introduced Elon agent hydroquinone developers with better stability and batch-to-batch uniformity than previous developers. These chemicals were the building blocks for Kodak prepared developers D-76, DK-50, D-8, D-11, D-19—all darkroom dependables for more than 40 years.

For years, the Eastman tested chemicals seal served as a reminder of our commitment to quality. The seal was replaced with the familiar trademark Kodak, and the testing is

more rigorous than ever. Quality-control procedures are applied to every batch of chemicals we produce or purchase. Those that don't meet established standards are rejected.



Kodak was already moving ahead with darkroom chemicals.

Kodak formulates and packages photographic chemicals for your convenience. We put them in bottles, cans, boxes, flexible container packages, and drums so you can use them effectively . . . and without waste.



Kodak Ektachrome and Flexicolor® chemicals also come in convenient kit form so you can use only as much as you need. Other Kodak chemicals are available in sizes to match your requirements, whether you're in the darkroom every day or every once in a while.

Kodak is a chemical company. Some 18,000 Kodak employees are involved in the research, development, and production of chemicals. Our photographic chemicals are available under 300 Kodak product names and in more than 1,000 sizes and product combinations.



Kodak chemicals give you more "miles per gallon" to lower processing costs.

We've combined solutions and steps to increase your productivity. For instance, with Kodak Ektaprint 2 chemicals, you can process color prints in as little as 8½ minutes with only two solutions.

And Kodak Ektaprint R500 chemicals help you make color enlargements from slides or larger transparencies in less time than it takes to develop some black-and-white films.

Obviously there's more to Kodak chemicals than you may have realized. So insist on quality; ask your dealer for a copy of "KODAK Photographic Chemicals" P3-189, or write to Eastman Kodak Company, Department 412L-139, Rochester, NY 14650.

Kodak

Professional films,
papers, chemicals:

More than meets the eye.



BRAND	CONTRAST GRADE	WEIGHT	IMAGE TONE	SURFACE	EMULSION TYPE	BASE	SIZES	MISCELLANEOUS/ COMMENTS
AGFA-GEVAERT, INC.								
Brovira 1	1-5	S	neutral black	glossy	silver bromide	fiber	8x10, 11x14	Brovira Speed papers may be processed conventionally or by stabilization. Contrast-grade designations reflect new grading system: new grade designations are identical to former grades but listed as one grade lower (e.g., former No. 6 is now No. 5).
Brovira 111	1-5	D	neutral black	glossy	silver bromide	fiber	8x10, 11x14	
Brovira 119	1-4	D	neutral black	fine-grained lustre	silver bromide	fiber	8x10 to 16x20	
Brovira Speed 310	0-4	M	neutral black	glossy	silver bromide	R-C	8x10, 11x14	
Brovira Speed 312	0-4	M	warm black	matte	silver chlorobromide	R-C	8x10, 11x14	
Portriga-Rapid 111	1-3	D	warm black	glossy	silver chlorobromide	fiber	8x10 to 16x20	
Portriga-Rapid 118	1-3	D	warm black	matte	silver chlorobromide	fiber	8x10 to 16x20	
EASTMAN KODAK CO.								
Ad-Type	2,3	L	neutral black	smooth lustre	silver chloride	fiber	8x10 to 20x24 & rolls	Contact-print paper; folds without cracking.
Azo*	0-5	S, D	neutral black	smooth glossy	silver chloride	fiber	S: 2x2 to 20x24 & rolls D: 5x7 to 11x14 & rolls	Contact-print paper.
	1-4	D	"	smooth lustre	"	"		
	1-4	S, D	"	fine-grained lustre	"	"		
Ektalure*	—	D	brown black	fine-grained lustre, fine-grained high-lustre, tweed-lustre, silk high-lustre, tapestry lustre	silver bromide	fiber	2½x3½ to 20x24 & rolls	Available in warm-white & cream-white base tints.
Ektamatic SC*	V-C	L, S, D	warm black (stabilization) or neutral black (tray processing)	smooth glossy, smooth lustre	silver chlorobromide	fiber	4x5 to 16x20	May be tray- or stabilization processed.
Kodabrome II RC*	soft, medium, hard, extra-hard, ultra-hard	M	warm black	smooth glossy, smooth lustre	silver chlorobromide	R-C	3½x5 to 20x24 & rolls	Replaces Kodabrome RC paper. May be tray- or machine-processed.
Kodabromide*	1-5	L, S, D	neutral black	smooth glossy, smooth lustre, fine-grained lustre	silver chlorobromide	fiber	3½x4 to 20x24 & rolls	Also available in cream-white in some surfaces.
Medalist*	1-4 2,3	S D	warm black "	smooth glossy, smooth glossy, fine-grained lustre	silver chlorobromide "	fiber "	3½x5 to 11x14 5x7 to 16x20	Has cream-white base tint.
Mural*	2,3	S	warm black	tweed lustre	silver chlorobromide	fiber	16x20, 20x24 & rolls	
Panature Portrait	—	D	warm black	fine-grained lustre	silver bromide	fiber	8x10 to 16x20 & rolls	Panchromatic emulsion.

Panalure II RC	—	M	warm black	smooth glossy	silver chlorobromide	R-C	5x7 to 16x20 & rolls	Replaces Panalure. Can be tray- or stabilization-processed.
Polycontrast*	V-C	L, S, D	warm black	smooth glossy, smooth high-lustre, smooth lustre, fine-grained lustre	silver chlorobromide	fiber	3 1/2 x 5 to 20x24 & rolls	
Polycontrast Rapid*	V-C	S	warm black	smooth glossy, smooth lustre, fine-grained lustre, silk high-lustre	silver chlorobromide	fiber	4x5 to 20x24 & rolls	
	"	D	"		"	"	5x7 to 20x24 & rolls	
Polycontrast Rapid II RC*	V-C	M	warm black	smooth glossy, smooth lustre	silver chlorobromide	R-C	5x7 to 30x40 & rolls	Replaces Ektabrome SC and Polycontrast Rapid RC papers. Can be tray- or machine-processed.
Portrait Proof	—	S	warm black	tweed lustre	silver bromide	fiber	5x7 to 11x14	Developing-out paper.
Resisto*	2,3	S	neutral black	smooth lustre	silver chloride	R-C	8x10 to 20x24	Contact-print paper.
Studio Proof	—	S	red-brown	smooth glossy	silver chloride	fiber	4x5 to 20x24	Printing-out paper—doesn't need processing.
Velox*	1-4	S	blue-black	smooth glossy	silver chloride	fiber	2 1/2 x 3 1/2 to 20x24 & rolls	For contact-printing negatives
FREESTYLE SALES CO., INC.								
Empress	1-4	S	cold black	glossy	silver bromide	fiber	5x7 to 16x20	
Empress RC	1-4	M	cold black	glossy	silver bromide	R-C	5x7 to 11x14	
FSC Metallic	—	M	cold black	glossy	silver bromide	fiber	8x10 to 16x20	When printed, background becomes lustrous metallic in gold, silver or copper color.
Oriental Center	2,3	D	warm black	glossy, matte	silver chlorobromide	fiber	5x7 to 16x20	
Oriental Seagull	1-5	S, M, D	cold black	glossy	silver bromide	fiber	5x7 to 16x20	
	"	"	"	semimatte	"	"	"	
	"	"	"	lustre	"	"	"	
ILFORD INC.								
Ilfbrom*	0-5	S	neutral black	glossy, semimatte	silver bromide	fiber	5x7 to 16x20 & rolls	
	0-4	D	"	glossy, semimatte, matte, velvet stipple	"	"	5x7 to 20x24 & rolls	
Ilfbrom Gallery	1-3	D	neutral black	glossy, matte	silver bromide	fiber	NA	Available starting March 1979. Designed for professional use.
Ilfospeed*	0-5	M	neutral black	glossy, semimatte, silk, pearl	silver bromide	R-C	5x7 to 20x24	
Ilfospeed Multigrade	V-C	M	neutral black	glossy, pearl	silver bromide	R-C	5x7 to 20x24	
Discovery Packs A-Ilfbrom	1-4	S	neutral black	glossy	silver bromide	fiber	8x10	Packs contain 10 sheets each of grades 1-4
C-Ilfospeed	1-4	S	neutral black	glossy	silver bromide	R-C	8x10	

BRAND	CONTRAST GRADE	WEIGHT	IMAGE TONE	SURFACE	EMULSION TYPE	BASE	SIZES	MISCELLANEOUS/ COMMENTS
LUMINOS PHOTOGRAPHIC PRODUCTS								
Bromide	2-3	D	neutral black	glossy, semimatte, crystal-grain high lustre	silver bromide	fiber	5x7 to 16x20	
Bromide (Universal F)	1-4	S	warm black	glossy	silver bromide	fiber	5x7 to 11x14	
Bromide ZF*	1-5	S	neutral black	glossy	silver bromide	fiber	4x5 to 11x14	
Lumifast RD	2-3	M	neutral black	crystal-grain high-lustre, lustre silk, pearl, instant glossy, velvet matte	silver bromide	R-C	5x7 to 11x14	
Pastel	approx. 2	S	red, green, yellow, blue	matte	silver bromide	fiber	8x10 to 16x20	Image whites assume paper tone.
Photographic Linen	approx. 2	—	neutral black	linen- textured canvas	silver bromide	white fine- weave cloth	8x10 to 16x20 & rolls	May be glue-mounted, dry mounted, stretched and tacked to frame, washed and ironed.
Portrait Proof	approx. 2	M	brownish- black	rough (suedelike)	silver bromide	fiber	5x7 to 16x20	Embossed into antique-type writing paper.
Portrait Deluxe Rapid*	2-3	D	warm black	silk/white fine-grain lustre	silver bromide	fiber	3 1/2x5 to 16x20	
Charcoal-R*	approx. 2	D	warm black	rough	silver bromide	fiber	8x10 to 20x24	Designed for portrait work.
Linon-T*	"	"	"	natural white linen finish	"	"	"	
Tapestry-X*	"	"	"	canvas finish	"	"	"	
RD Bromide *	1-4	M	neutral black	instant gloss, velvet matte, lustre-silk	silver bromide	R-C	5x7 to 20x24	Features high-speed processing with normal chemicals.
SPIRATONE INC.								
Spiratone*	2-3	M	neutral black	glossy, silk, semimatte, crystal	silver bromide	R-C	8x10	"Crystal" is fine-grained, lustrous, slightly stippled finish.
UNICOLOR								
Unicolor B&W Baryta	2-3	S	warm black	semimatte	silver chlorobromide	fiber	8x10, 11x14	
Unicolor Resin Base*	1-3, 6	M	warm- neutral black	glossy	silver chlorobromide	R-C	5x7 to 16x20	
	2-3	"	"	matte, silk, fine-grain, pearl	"	"	"	

Key

D—Double-weight
L—Lightweight
M—Medium-weight
NA—Information not available at time of writing.
R-C—Resin-coated
S—Single-weight
V-C—Variable-contrast

*Not available in all grades, weights, surfaces or sizes
listed; see your dealer for more specific availability
information.

Information is as accurate as possible at time of writing
but subject to change without notice.

PAPER PRIMER

many negative problems. Flat, low-contrast negatives can be made to produce satisfactory images by printing them on higher-contrast papers. Similarly, every recorded tone in a contrasty negative can be revealed by printing it on a lower-contrast paper.

It may be necessary to consider the type of enlarger you will be using when selecting a contrast grade of paper. Since condenser-type enlargers tend to produce a sharper, more contrasty image (because of the brilliance and concentration of their light), with the reverse being true of diffusion-type enlargers, you might have to compensate for your particular type of enlarger when you choose your contrast grade. (The difference in contrast value between the two types of enlarger light on the same grade of paper is about one-half grade.)

Different moods are obtainable with different contrast values. For example, portraits may be more effective when printed on softer paper because low contrast grades produce softer, more contoured images. The higher contrast grades are excellent when the effect desired is stark realism. Softer papers more faithfully reproduce the full range of tones present in the original scene, but sometimes at the expense of deep shadows and crisp highlights; each extreme must be considered and used carefully for optimum effects.

Surface—High-gloss papers are the best choice when you want to have a complete tonal range and when you want to preserve sharp, fine details. They are good for reproductions or copy work and are also appropriate for small prints where detail and sharpness are important. Matte and textured finishes are best when you want to hide something or subdue detail or grain, and for subjects such as portraits. They also add interest to broad, plain image areas. If you're going to display your print, display conditions such as lighting should be considered when deciding on print surface.

Tone—Choose a tone that will complement and highlight your subject. Cold papers (with bluish blacks, for example) might be a good choice for subjects such as glass or architecture; they're also good for photojournalistic images and winter landscapes. Warm-toned papers are generally more suitable for portraits and pictorial subjects. (It should be noted that warm-toned papers have a shorter tonal range than neutral and cold papers since they can

MANUFACTURERS/DISTRIBUTORS

Agfa-Gevaert, Inc.
Dist. by Braun North America
55 Cambridge Parkway
Cambridge, Massachusetts 02142
Eastman Kodak Company
343 State Street
Rochester, New York 14650
Freestyle Sales Company, Inc.
5124 Sunset Boulevard
Los Angeles, California 90027
Ilford Inc.
West 70 Century Road
Paramus, New Jersey 07652
Luminos Photographic Products
25 Wolfe Street
Yonkers, New York 10705
Spiratone Inc.
135-06 Northern Boulevard
Flushing, New York 11353
Unicolor Division, Photo Systems Inc.
7200 Huron River Drive
Dexter, Michigan 48130

never achieve a true black.)

Weight—Single-weight papers are quite suitable (and more economical) for making small prints. They dry more quickly than double-weight papers, but double-weight papers will withstand the processing much better. They are more stable in the washing tray and you can handle them a little more roughly. They will lie flatter than single-weight papers, which can change shape during drying, and can be mounted with greater ease and smoother results. The rigidity of double-weight papers also makes them more suitable for larger prints.

Speed—A paper's speed rating indicates how long it will be under the enlarger. Medium-speed papers allow the greatest amount of exposure control. Fast or "rapid" papers have less exposure latitude but are extremely convenient when making very large prints, when making enlargements in volume, and when working with very dense negatives.

Stabilization papers, which are processed with special chemicals and equipment, are primarily used commercially. Ilford and Eastman Kodak manufacture stabilization papers in addition to their regular line; and the following companies offer a complete line of stabilization papers: Agfa-Gevaert, Inc., Rapid Processing Systems Department, 275 North Street, Teterboro, New Jersey 06708; and Peck Sales Company, 7326 Laurel Canyon Boulevard, North Hollywood, California 91605.

In addition to the papers listed in the chart, there are imported papers available through American distributors; one such imported line is Ciba Enlarging Papers, distributed by General Photo-

graphic Supply Company, 311 Cambridge Street, Boston, Massachusetts 02114. Check your local photo dealer for other available imported papers.

HANDLING AND STORING PAPERS

Storing papers under good conditions is important and necessary to maintain quality and uniformity. Poor storage can cause serious paper deterioration, which can ruin even the most carefully printed image.

Don't store your paper where the temperature is too high. Optimum storage temperature is 40-50°F. for long-term storage. Also, excessive humidity may cause fungus to grow on the emulsion; lack of sufficient humidity will cause the paper base and emulsion to become brittle. Therefore, try to store your paper in an area where humidity is about 40 percent.

Pay attention to the expiration date on the outside of the paper package. If stored under good conditions, your paper should retain its quality well past this date, but use it as a guide, just as the manufacturers do. Buying out-of-date paper is tricky business because you really don't know under what conditions it was stored and, therefore, how reliable the paper will be. Whenever you buy new paper, be sure to first use up any paper of the same type that has an earlier expiration date. A few other suggestions: Don't discard the inner wrap; use it to rewrap the unused paper. And never leave the lid off a box of paper!

Be sure to handle paper gently and only by the edges. Photographic paper is very fragile and can easily pick up nicks and cracks as well as fingerprints and chemical stains, so keep your hands clean and dry whenever you handle paper.

Kodak offers two other pieces of advice: Don't stack paper packages on top of each other; stand them up sideways to avoid unnecessary pressure. Also, avoid storing photographic papers in areas where there are noxious fumes from engines, paint, lacquer or plastic solvents.

Characteristics and properties, handling and storage—a knowledge of all of these elements of paper use is essential to the making of a fine print. Your print is where your image is realized, where your photographic vision is rendered so that others may share it. By selecting the correct paper for your needs, you can have maximum control over your results. This survey of all the most readily available enlarging papers on the market today will aid you in the selection process. □

You still have 11 chances to WIN the SLR Camera of your choice in the

Photographic

\$30,000.00

SUPER SWEEPSTAKES

If you're like most photographers, you love a new piece of equipment. Especially a new 35MM SLR. You can't wait to pick it up and put your first few rolls through it. The excitement you feel and the camera's precision add up to an unforgettable



experience. Now, just imagine if that camera were **FREE**.

That's exactly what you'll get—A **FREE 35mm SLR**—if you're one of the 11 **GRAND PRIZE winners** in the **PHOTOGRAPHIC \$30,000 Super Sweepstakes**.

PHOTOGRAPHIC invites you to enter the \$30,000 SUPER SWEEPSTAKES and be eligible for 6 SUPER DRAWINGS, 11 GRAND PRIZE SLR CAMERAS. With 1,529 total prizes to win, you just may enlarge your world of photography.

6 SUPER DRAWINGS

There will be 6 Super Sweepstakes Drawings held between March 28 and August 30, 1979. In all, you've got 11 chances to win the 35mm SLR of your choice, plus 1,528 other chances to win the 1,529 other great photographic prizes.

Don't pass up this chance to **WIN** the SLR you've always wanted, or the second one you've always needed.

EXPAND YOUR WORLD OF PHOTOGRAPHY

Why a sweepstakes? For one, we'd like to share our 7th Anniversary with you. Two, we'd like you to know about the lowest price available on **PHOTOGRAPHIC MAGAZINE—12 issues (1 year) for only \$5.97—\$4.98 off the regular price and \$12.03 off the single copy value.**

Three—we want you to expand your photographic capabilities. **PHOTOGRAPHIC MAGAZINE** can help you do just that. And you just may win one of the following fabulous prizes:

11 GRAND PRIZES—Your choice of the following top name SLR's:

NIKON FE with F2 lens: Frame, focus, shoot and rely on the camera's electronic wizardry. Exhilarating responsiveness combined with the sheer joy of handling. Small, light, but built solidly to balance perfectly.

CANON AE-1 with F1.8 lens: A compact model of uncluttered photographic engineering. It selects correct exposure to capture the most sudden lighting changes. Fully automatic with manual override.

MINOLTA XG-7 with F1.7 lens: Advanced automation plus MINOLTA quality and compact handling that's amazingly smooth, quiet and comfortable. Also includes manual override.

OLYMPUS OM-2 with F1.8 lens: The only SLR with "off-the-film" light measurement to provide the ultimate in automatic exposure control. Plus, 13 interchangeable screens to meet any need.

PENTAX MX with F1.7 lens: Rugedness, consistency, adaptability—and not an ounce of extra weight for the photographer who wants full control of his craft.

KONICA T4 with F1.7 lens: With KONICA's famed 3-way exposure system, you have automatic, semi-automatic and manual exposure. Plus an easy-to-use multiple exposure lever for special effects.

55 FIRST PRIZES

FIRST PRIZES—Electronic Flash Units.

Rollei 121 BC—Extremely compact automatic computer flash; color-corrected lens for daytime balance; wide-angle coverage.

AIC MK-3A—Automatic range of 3-17 feet; 270 flashes from 4 penlight batteries; weighs only 5 ounces.

Sunpak 300—3 way mount lets you select the most convenient position; 275 flashes with alkaline batteries.

Vivitar 215—A fast 5 second recycle time; automatic exposure from 3-15 feet; plus manual override.

Braun 23B—Light and easy to handle; 250 flashes with 4 penlight batteries; color-corrected horizontal reflector.

88 SECOND PRIZES

SECOND PRIZES—110 Format Cameras

Fujica Pocket 300—Super-sharp ultraviolet filtered lens eliminates haze; shutter set at 1/125 eliminates camera shake.

Kodak Trimlite 28—Sliding lens cover; color-corrected 3-element lens provides sharp picture from 5 feet to infinity.

Minolta Autopak 200—Shoots from 3 feet to infinity; built-in lens cover locks shutter; viewfinder contains low-light warning signal.

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mike kenna: tone poems

□ The photographer's camera and the silver-halide crystals on his film and paper are his brush and pigment. He can render a scene as imaginatively as artists working in any medium; he can also strive as hard as they for a strict likeness, within the limitations of his equipment, and eventually be satisfied that he's produced a reproduction faithful to the original.

There is a subtle but crucial difference between this and Mike Kenna's definition of a "faithful reproduction." The standard approach assumes that in a successful work the image has survived its transition into print virtually intact and is therefore a trustworthy rendition of the original scene. Kenna,

however, believes that the essence of a scene is often obscured through the many transitions it undergoes, starting with the shutter's snap, but the photographer has a chance to restore the image's character—in the darkroom.

Mike Kenna approaches his subjects with profound respect, both in photographing and printing them. Unwilling to impose himself upon a landscape, he maintains a detachment from it so that its beauty or mystery can emerge pure. Often, intensive darkroom work follows, in

which he works with a print until it reveals all the qualities of the original scene: "I try to take the scene back to what I felt it was." The integrity of his approach, as well as the beauty of its results, is manifest in the photographs on these pages. □

Mike Kenna is an English-born photographer with a background in editorial, advertising and studio work, and is represented by a number of galleries. As well as continuing with his landscapes, Kenna is currently photographing for the San Francisco Ballet Company. The photographs on these pages were taken using Nikon cameras and lenses in focal lengths from 20 to 200mm.







mike kenna







mike kenna





mike kenna





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THE GREAT PAPER CHASE

HOW TO CAPTURE
PRINT QUALITY

BY DAVID BROOKS

Ask any number of professional photographers for their favorite enlarging paper, and chances are you'll get as many different answers. This lack of a consensus is complicated by the fact that their criteria of choice are often subjective and not based on any meaningful, methodical comparative testing.

Therefore, to save yourself a lot of wasted time and paper, you would be well-advised to go through the step-by-step procedures of making comparative tests of black-and-white printing papers. The tests and comparisons should provide much more than just a basis for choosing one paper over another. No one paper is ideal for all purposes or suits the tastes of every photographer. Even the most respected printers do not agree on what is the "best" paper. Their choices, however, do include the factors of experience and printing skills, which assure that their selections are made on the basis of a printing technique that yields maximum performance from any paper chosen. An important part of the test procedures, then, is to determine the limits of maximum performance and to establish and define the performance capabilities of any given paper.

PRINT PERFORMANCE CRITERIA

Before taking a selected sample of printing papers into the darkroom, let's at least agree on the criteria of print

1. The path to print quality can be crooked and meandering with many detours along the way. Or, by using objective, comparative tests, it can lead straight to a paper/developer combination and a technique that end at your precise, pre-visualized destination.

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performance. Just what characteristics of image quality are involved and what the optimum of performance is for each dimension of quality require definition and specification. Some print characteristics lend themselves to quantitative comparison and can even be measured with appropriate instrumentation, while others simply differentiate one paper from another on the basis of personal taste. Many essentially nonquantitative characteristics are important to selection, as they affect the interrelated qualities of a printed image, making one paper more or less an advantage when printing particular kinds of negatives and specific kinds of images.

An image is represented in a photographic print by a range of tones, from paper-base white through tones of gray to the maximum black the paper will reproduce. The quantitative criteria of paper performance include the whiteness of the paper base (how much light it will reflect), the maximum black or highest density produced by exposure and development (how little light it will reflect), and the range in between.

Obviously, a paper with a superior paper-base white may not have the densest black. A paper with an extremely dense maximum black may not have the whitest paper base. And a paper with an extended tonal range may have neither the whitest paper base nor produce the densest maximum black.

Although paper-base white and maximum black are important arbiters of image quality affecting image brilliance and contrast, the most significant portion of all but a few printed images is composed of a range of tones falling between these two extremes. The tonal densities that make up most of an image are produced by varying degrees of exposure and then development. Printing papers do not respond linearly to equal increases in exposure to produce equivalent print densities. If the response in densities of a printing paper to light is measured and charted on a graph with equal spacing for increments of exposure and density, a straight line would be projected from the point of no exposure and no density to the point of maximums of exposure and density, if the paper's response were linear.

However, papers, like films, respond

to exposure and development with lesser differences in densities at low levels of exposure and at exposure levels approaching maximum, creating a charted graph response that forms a gently "S"-shaped curve. Differences in a paper's response to the range of exposure intensity (negative contrast) are indicated by the overall steepness of the graphed response line, reflecting paper contrast. The shape of this graphed line indicating response in density to exposure is referred to as the *characteristic curve*. If the curve is long and gradual at the bottom (*toe*), the separation of tones in the lighter values in a print is not as great as it is with a paper that has a straighter-lined toe response. At the other end of the characteristic curve (*shoulder*), a straight line also indicates greater separation of tone than with a paper having a long, gently-shaped curve response, but affecting the shadow areas of an image rather than the highlights. The center, straight-line portion of a characteristic curve represents the midtones and the greatest separation of tones.

A characteristic closely associated with tone separation, but less measurable, is *tone gradation*. Papers differ in their ability to reproduce subtle and gradual changes in image tone. This performance feature may vary with respect to the characteristic curve response of a paper. One paper may effectively reproduce tone gradations in midtone and highlight areas but not in the shadow areas, while another may preserve subtleties of tonal change well in shadows but not in higher values. The coloration of image tone is almost purely a matter of subjective taste. Coloration is a function of both the paper base and the emulsion. Paper-base color remains relatively constant while the emulsion color often changes with different developers.

A test of printing paper performance is quite impossible without involving a developer. Developers affect the performance of a paper not just in terms of image coloration but also by influencing the characteristic curve response and the maximum black produced. A comparative printing paper test must really be a test of printing paper/developer combinations.

PAPER AND DEVELOPER SELECTION

The first step in making the test is the selection of particular papers and developers for comparison. Since little can be learned from comparing apples and oranges, some discrimination in



2. A Kodak Step Tablet is the only item not found in every darkroom that is needed to perform paper/developer tests. The Step Tablet provides a way to print an image with an enlarger to produce tones that can be directly related to specific and equal divisions of negative density. The evidence furnished by printing a Step Tablet can be used to determine the negative density-range requirement of a paper/developer combination as well as providing the visual means for ascertaining the characteristic-curve response of the combination used.

3. Different developers contain different reducing agents, which transform a latent print image into metallic silver. The particular developer and the length of development used with a specific paper can modify many of the characteristics of an image produced by a paper, including image-tone coloration, maximum black and contrast. Any comparative test of printing papers requires the use of a developer, and more than one if a comprehensive assessment of paper/developer performance is expected.

choosing both developers and papers is required. Black-and-white printing papers vary in characteristics on several levels, including type and weight of base material, surface, inherent coloration of the emulsion, and whether the paper is variable or graded contrast. Developers differ fundamentally as to the image coloration they are intended to produce, type of formulation and the form in which they are sold.

If, for instance, a comparison is to be made among X, Y and Z brands of paper, the samples of each should be of the same type of paper base (resin-coated or fiber base), the same type of surface (glossy, matte, etc.), the same paper base color (white, cream, etc.), the same image tone (cold or warm tone), the same weight (single, medium or double), and the same contrast type or grade (No. 1, 2, 3, etc.) The developer selection must also be consistent and applicable to the paper type being tested. If cold-tone papers are being



tested, a selection of developers recommended for use with cold-tone papers is appropriate.

As an example to serve as a model test, I made a selection of fiber-base, double-weight, glossy-surface, cold-tone graded-contrast papers: Agfa Brovira, Kodak Kodabromide, Ilford Ilfobrom and Oriental Seagull, in contrast grade No. 2. The developers I chose are all recommended for use with this type of cold-tone paper. I selected Kodak's popular metol/hydroquinone developer, Dektol; Ilford's Phenidone developer, Bromophen; and Unicolor's new black-and-white paper developer, which uses the Kodak developing agent Dimezone. Dektol is a single, dry-powder developer that makes up into a stock solution for a normal dilution of 1:2; Bromophen is a two-part, dry powder developer that makes up into a stock solution for a normal dilution of 1:3; and Unicolor Black-and-White Paper Developer is a liquid concentrate diluted 1:9 for use.

Comparing three or four different brands does not have to be expensive, as only minimal quantities and the

smallest normal paper size are needed. Special items needed should be found in all darkrooms and include enlarger, trays, stop bath and fixer. One extra item essential to part of the test is a Kodak Step Tablet. Step Tablets are available in three sizes, 3 3/16 inches, 5 1/2 inches and 9 7/8 inches long. The shortest, No. 1A, has 11 steps .30 density increments apart, ranging from .05 to 3.05. Nos. 2 and 3 have 21 steps .15 density increments apart, ranging from .05 to 3.05. Nos. 2 and 3 are also available calibrated, but this extra feature and expense is not required for the tests. The No. 2 Step Tablet is the best choice for most photographers because most of the steps can be covered by the largest-format negative carrier of most enlargers.

THE TESTS

Only three simple procedures are required to produce the evidence needed for evaluation and comparison. A fourth test, using an ideal negative to create sample prints of an actual photographic image, is optional.

The first procedure is designed to determine the maximum development that can be used with a particular paper/developer combination. Paper and developer manufacturers usually provide a recommendation for development time. Most often this is the minimum time that will yield an acceptably full range of image tones. Remember, the largest users of papers and developers are commercial enterprises. Time is valuable in a business operation, so using the least time needed to produce an acceptable image is an advantage to the commercial printer. It stands to reason, however, that the deepest black a paper can reproduce is attained when development is long enough to convert all the *exposed* silver particles in the emulsion to metallic silver. There is a limit to how long a paper can be developed, though. That limit is reached when development begins to produce chemical fog—creating density in the *unexposed* portions of the print image.

The first test, then, establishes at what level of development the first signs of chemical fog are produced. The results of the test can be used to determine a developing time short of creating chemical fog, but long enough to ensure maximum development of the exposed silver in the print emulsion. The second procedure tests two functions: the development of maximum black for comparison of various paper/developer combinations and the amount of exposure required to pro-

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duce maximum black with a particular paper/developer combination.

The third procedure uses the Step Tablet to test the response of a paper/developer combination to specific controlled and related levels of exposure. The reproduction of the densities in a Step Tablet by each paper/developer combination provides evidence for evaluation and comparison on many levels. First, the density range of a negative material that a combination is capable of producing can be established. Second, each combination's characteristic curve can be visually assessed and compared with the others. And finally, the effects of developers on various papers in terms of image-tone coloration can be compared visually, while the different papers' image-tone characteristics can also be compared using the same and different paper developers.

DEVELOPMENT-TIME TEST

The first test procedure only involves development. One developer at a time can be tested, or a number of developers can be prepared to test several paper/developer combinations simul-

taneously or consecutively. Each developer should be mixed and diluted for use in its own tray with a code used to identify each. Only single trays of stop bath and fixer are required. Another tray of water, or a print washer, is necessary to hold the processed print material until testing is complete and all the material can be washed at one time. All solutions should be maintained at 68°F. $\pm 1^\circ\text{F}$.

Begin by cutting the papers to be tested into eight small strips. This and subsequent steps can be conducted under safelight illumination, but the light level should be kept to a minimum, and the emulsion surface of the paper should not be exposed to direct safelight illumination. On the back of each strip print a code letter or number that identifies the paper and the developer in which it will be processed. Also, make numerical notations to identify the length of development each strip will receive. Begin with zero and continue from the maximum developing time recommended by the paper or developer manufacturer by adding one minute onto that time for each of the remaining strips of each paper. For instance, Kodabromide paper can be given a code letter "K," Dektol a code

letter "D," and the eight strips marked KD-0, KD-3, KD-4, KD-5, KD-6, KD-7, KD-8 and KD-9. The KD-0 strip is placed directly in the fixer and left until the emulsion is fully cleared. The seven remaining strips are placed in the tray containing Dektol and agitated continuously.

Start the timer as soon as the strips are in the developer. After three minutes have elapsed, remove the KD-3 strip, place it in the stop bath for 30 seconds, and then move it to the fixer. After four minutes of total development time, remove the KD-4 strip from the developer. As each minute of development time passes, remove the strip numbered for that period until all the strips through KD-9 are developed. Each strip should receive 30 seconds in the stop bath and the recommended time in the fixer for the particular type and brand used. During the entire process remember to keep the safelight level as low as possible and the emulsion side of the paper strips facing down away from the light.

For each paper/developer combination being tested, prepare a set of paper strips and code them according to the combination and the development times they will receive. Repeat the development procedure just described for each combination. After all the combination strip sets are processed, wash them thoroughly, remove excess moisture and lay them out on a screen or towel to air dry. After they have dried they are ready to be evaluated.

Place the strip from one combination that received no development, No. 0, under good illumination. Then, by comparing the developed strips for the same paper/developer combination, identify the development time that produced the first sign of noticeable density greater than the paper-base white of No. 0. When that time is reduced by 20 percent, a safe maximum developing time has been determined for that particular combination. Record this test conclusion for future use in subsequent tests.

MAXIMUM-BLACK TEST

The second test procedure calls for an enlarger as a light source. Again, small strips of paper coded to identify the paper/developer combination are needed, at least two per combination. One strip should be marked with a number corresponding to the developing time recommended by the paper and developer manufacturers, the other corresponding to the developing time derived from the previous test. The developers, stop bath and fix should be



4. Testing several paper/developer combinations need not be expensive. Each test uses only a few small strips of each kind of paper, leaving most of even the smallest-sized packages for making prints. The total number of strips created by the end of the testing procedure, however, is enough to require carefully identifying each with a code keyed to the paper, the type and brand developer it's processed in, the exposure data and the length of time the strip is developed.

5. Each developer to be used in the tests should be freshly mixed. A tray for each should be tagged to identify the contents. Be especially careful to maintain the developer solutions as close to the standard 68°F. as possible to ensure both effective comparisons and the future usefulness of the data derived from the testing.

placed in their respective trays with each developer tray labeled to identify its particular solution.

Adjust the enlarger so that the format of the projected light covers the entire area of the longest dimension of one of the paper strips. Focus the lens for that magnification at the baseboard, with the aperture closed to a smaller f-stop than would normally be used to make a black-and-white print at that enlarger position. The enlarging timer should be set for a period between one fourth and one half the time usually required to print the size image at which the enlarger is set. You will also need an opaque card larger than the area of two test strips.

With just safelights on, place two strips of the same kind of paper coded for one developer side by side in the center of the area covered by the enlarger illumination format. Then cover all but one eighth of the two strips, leaving only a small segment of each strip uncovered. Turn on the enlarger light with the timer set to the period previously determined. Move the



opaque card to reveal another eighth of the two strips and make another timed exposure with the enlarger. Repeat this procedure until the two strips are completely exposed. The strips will then have received equal steps of increased exposure.

As soon as the strips are exposed, place them in the particular developer tray for which they are coded and set the timer to the period determined by the previous development-time test. Agitate the strips, watching the timer. At the conclusion of the period recommended by the paper and developer manufacturers, remove the strip coded for that time, place it in the stop bath and then fix it. When the period is complete for the development period set, remove the second strip to the stop bath and fix. Place both strips in a holding bath of water until all pairs of strips for each paper/developer combination have been exposed in the

same manner and developed. After all pairs for each combination have been exposed and processed, thoroughly wash and dry all the strips in the same way as recommended for the development-time test.

When the strips are dry, they may be examined for evaluation. At first keep the pairs together for each paper/developer combination. Visually identify the segment of each strip that required the least exposure to attain maximum black, using bright, even illumination. Looking at the strip from the least dense end, this will be the step after the last step of exposure with clearly defined borders. Maximum-density black is the first segment of exposure that produces a black that merges on one side into an undefined area of continuous maximum tone.

For future ease of identification, cut a small notch into one side of the segment identified as the maximum black achieved with the least exposure, as shown in photos No. 6-8. Count the number of segments, including the maximum black that has been identified, to find the number of exposures required to achieve maximum black. Multiply that figure by the period of exposure time used for each segment. On the back of the strip indicate the total exposure time necessary to produce maximum black from the multiplication of the segments and from the individual segment exposure time.

When the maximum black exposure segment is identified for a pair of strips for a particular paper/developer combination and notched, pick up the pair with those segments next to each other and place them in front of the viewing light source with the emulsion side toward you. If the strip that received the longer development produced a denser black than the strip that received less development in the segment that was identified and notched, then the advantage of using the maximum safe development time is clearly established.

After each pair of strips has been examined and the maximum black segments notched, the strips from different combinations can be compared with each other by both reflected and transmitted light to determine which paper yields the deepest maximum black, and which developer produces the deepest black with any particular paper.

The exposure time calculated to produce maximum black with each combination at each rate of development will be used in the next and final test procedure. At this point you may want

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trast. With the Step Tablet projected in the same manner as a negative would be, a direct correlation between the effects of printing the Step Tablet and a negative can be made.

Once the Step Tablet is masked and placed in the negative carrier, focus the image on the easel's surface. Adjust the easel to hold the paper test strip so that the format of the projected Step Tablet image covers the area of the test strip. Remember that the density range of the Step Tablet is from .05 to 3.05, so only a portion (fewer than half) of the steps will record an image on the printing-paper test strip. If the denser end of the Step Tablet can't be included inside the area of the negative carrier format and projected onto the test strip, it will not affect the test result.

With the easel adjusted and only the safelights on, take one of the cut and coded test strips and place it in the easel. Set the enlarger timer to the period determined to be the minimum for producing maximum black for the paper/developer and developing time produced by the evidence from the maximum black test. Expose the strip for the time set. Now develop the strip in the developer for the combination coded on the back of the strip for the time indicated by the number coding. After development and immersion in the stop bath, fix the strip and place it in a water holding bath. Repeat the procedure for each of the strips for each combination of paper and developer, adjusting the exposure time according to the data derived from the maximum black test. When all the strips are exposed and processed, wash and dry them in the same manner as specified for the previous tests.

The evaluation of the strips yields an abundance of information on several levels. First of all, the Step Tablet reproduction provides the negative density range that a particular paper/developer combination and developing time will produce. Simply count the number of steps of distinguishable tones in which detail could be represented, excluding maximum black and paper-base white. Add the density values of the steps in between these two extremes, and the sum less .15 will be the correct density range for a negative suitable for printing with that paper/developer combination. Let's say there are seven steps between paper-base white and maximum black reproduced from an uncalibrated Step Tablet. With a density of .15 for each step, the total density range for the

PAPER CHASE

to begin keeping a written record, which is more manageable for reference than having to leaf through the test strips for information. Vertically list each paper/developer combination. Make columns adjacent to the listing to enter the maximum developing time and the exposure time required to achieve maximum black at both development times tested, including the enlarger magnification and the lens aperture setting.

STEP TABLET TEST

Though the two preceding tests are valuable in producing evidence for evaluation, they also serve as preparation for this final test. Begin by cutting two or three test strips of paper for each paper/developer combination and identify them by code for each combination. Number one strip in each pair for the predetermined maximum safe development time established for the combination from the first test, and the other for the development time recommended by the paper/developer manufacturer. A third strip may be prepared for an intermediate development period. The enlarger magnification setting

to expose the Step Tablet should be the same as it was for the previous test. The aperture, however, should be set at $\frac{1}{2}$ f-stop more exposure than for the previous test to compensate for the .05 base density of the Step Tablet and thus ensure sufficient exposure through it to produce maximum black. If, for example, the lens aperture was set at f/11 for the previous test, open the lens $\frac{1}{2}$ f-stop to $f/8 + \frac{1}{2}$.

Place the Step Tablet in the negative carrier of the enlarger. If the enlarger does not have adjustable masking, use two pieces of black paper, one on each side of the Step Tablet, to mask off any raw light from being projected through the negative carrier opening. For those with enlargers limited to 35mm negative size and smaller, the Step Tablet will have to be printed in contact with the paper rather than by projection.

Printing by projection is a distinct advantage because it automatically includes the variable effects of the enlarger optical system in the test evidence, making the data directly applicable to practical printing situations. Differences in lenses and light sources of various enlargers can have a marked effect on projected image con-

seven steps would be $7 \times .15 = .90$.

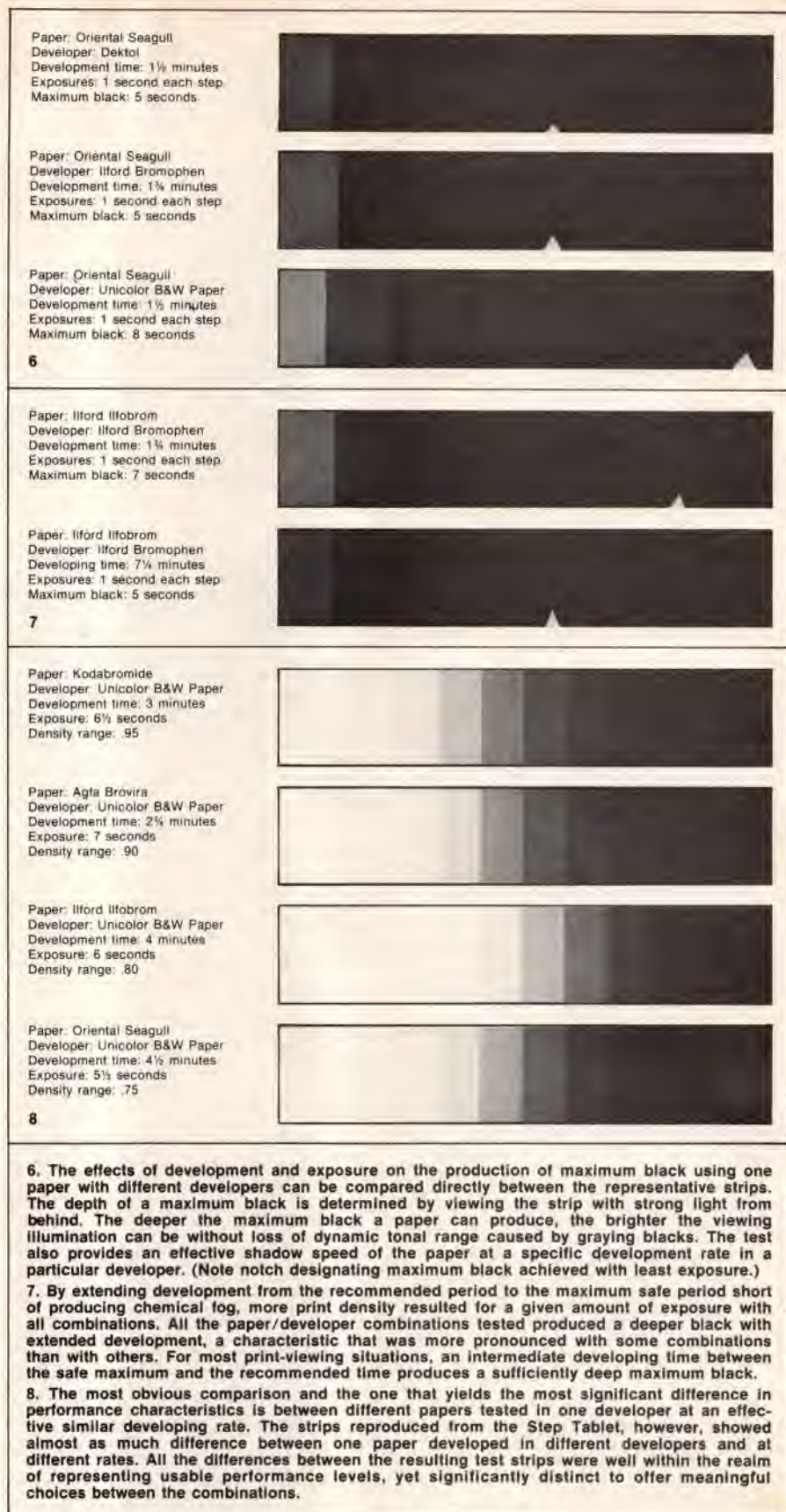
If this is done for each Step Tablet paper-developer strip and then recorded on the chart with the maximum development time and maximum black exposure time, a permanent record is established that can save considerable time and effort later on. If, for instance, in the future a negative to be printed has a density range of 1.05, the chart will reveal which paper/developer combinations can be used to print it effectively. Also, knowing the density-range requirement of a paper/developer combination makes it possible to adjust film exposure and development in relation to subject brightness range to produce negatives precisely matched to that combination.

MATCHING NEGATIVE CHARACTERISTICS

If there ever was a secret to producing fine print quality, it has long been part of the public domain. Virtually every popular teacher of technique has held that print quality is the function of a good negative. And a good negative is basically one that is matched in density range to the paper/developer combination used to print it. But there is more to matching negative contrast and paper contrast than is revealed by the reproduction of a Step Tablet using several different paper and developer combinations.

Though the density progressions of a Step Tablet are equally spaced approximately .15 apart, upon examining the reproduction of the Step Tablet it is apparent that the relationships of the steps are not equal. The midtones are separated by greater differences in density than tones at either end of the range—the tones representing highlights and shadows. This differential of tone-separation degree across the range of tones reproduced by the Step Tablet varies from one paper/developer combination to another. Some combinations yield greater or lesser tone separation in the midtone areas, while others yield stronger separations in highlights or shadows, in addition to the overall range of density reproduced. These differences in tone separation reflect differences in the characteristic-curve responses of various combinations. The rate of development may also modify a particular combination's reproduction of tone separation in any one of the three areas (midtones, highlights or shadows), changing the characteristic curve response.

Tone separation is important because it affects the internal contrast of



a printed image. In other words, within the overall contrast encompassing the reproduction of all the tones representing an image in print form, the degree of tone separation among highlights, midtones and shadows can affect the delineation of detail within those limited

areas. A high-key image, for instance, made up primarily of highlight tones, will likely benefit when printed with a combination that produces strong separation of tones in the highlights. On the other hand, a low-key image containing much important but subtle de-

PAPER CHASE

tail in the shadows would be most effectively represented in a print made with a combination that produces exceptional tone separation in the darker areas. Between these two extremes is the commercial subject, a product picture to be used in reproduction. It may be best represented in a print when a paper/developer combination that provides the strongest possible separation of tones in the midtone areas is used. What we find then is that matching a negative to a paper/developer combination involves more than just equating the overall contrast of each. It also requires a consideration of the characteristics of the image on the negative as they will be reproduced through the influence of the characteristic-curve effect of the paper/developer combination on both tone separation and local contrast.

The characteristic-curve response of a paper/developer combination is paralleled in the characteristics of a negative. Negatives exhibit the same distortion of tonal relationships compared to the original; they compress the tones, to a lesser or greater extent, at the extreme ends of the tonal-density range. So an awareness of negative characteristics as well as image characteristics is important to matching negatives and paper/developer combinations. A negative that has a long toe and produces weak tone separations in the shadows should not be matched with a paper that also has poor separation in the dark tones, unless the loss of image detail in the shadows is not important. The relationship between negative characteristic-curve effects on tone separation and a paper/developer's characteristic curve can be used complementarily to emphasize tone separation or in a compensating manner to yield moderate tone separation across the full range of reproducible tones in a print.

The Step Tablet test strips are also useful for evaluating the subjective qualities produced by various paper/developer combinations. The midtones of the strips can be compared for the kind of image coloration that is created by various papers in one particular developer, or by the effect of different developers on one particular paper. In addition, the strips reveal the relationship of paper-base coloration and the coloration of the image tone in light, middle and dark tones.

Developer	Paper	Standard Developing Time	Safe Maximum Time	Intermediate Development	Exposure Standard Development	Exposure Maximum Development	Exposure Intermediate Development	Negative Density Range Standard Development	Negative Density Range Maximum Development	Negative Density Range Intermediate Development
Dektol	Kodabromide	1.5	4.75	3	5	4	4.5	1.10	.90	1.05
Dektol	Brovira	1.5	5.5	3.5	7	4	5.5	1.20	1.00	1.10
Dektol	Ilfobrom	1.5	4.75	3	7	5	6	.90	.75	.80
Dektol	Oriental	1.5	4.75	3	5	3	4	.90	.80	.85
Bromophen	Kodabromide	1.75	6.5	4	4	3	3.5	.90	.75	.85
Bromophen	Brovira	1.75	6.5	4	7	6	5	1.15	.95	1.05
Bromophen	Ilfobrom	1.75	7.25	4.5	7	5	6	.90	.80	.85
Bromophen	Oriental	1.75	5.5	3.5	5	3	4	.85	.70	.75
Unicolor	Kodabromide	1.5	4.75	3	8	5	6.5	1.10	.90	.95
Unicolor	Brovira	1.5	4	2.75	8	6	7	1.05	.85	.90
Unicolor	Ilfobrom	1.5	6.5	4	8	4	6	.90	.70	.80
Unicolor	Oriental	1.5	7.25	4.5	8	3	5.5	.80	.70	.75

Charting the measurable data derived from the paper/developer tests puts the information in readily accessible form but also serves as another visual model for comparisons. Contrary to recent negative commentary on the quality of contemporary printing papers, the results of the tests indicated that many paper/developer combinations exhibited considerable development latitude in terms of both contrast and density change. In addition, the chart makes the contrast differences between the papers tested quite apparent. Simply adjusting negative contrast to a particular paper grade leaves the photographer well off-base unless the paper/developer combination is specified. Different negative contrasts are definitely required between different brands of contrast grade No. 2 paper, and even between different developers used with the same brand and grade of paper. Although these generalizations from my tests should not be affected by a different enlarger and different darkroom conditions, the specific data in the chart would. The exact performance of a paper/developer combination is directly tied to the equipment and conditions of a particular darkroom setup. This chart can only serve as a model for individual photographers to fill in the numbers from their own tests.

How a particular paper/developer combination performs when exposed with a negative containing an image typical of an individual photographer is obviously important. The data from the Step Tablet, however, should show that the negative density range requirements of different paper/developer combinations are not the same. If you take just one sample negative and make test prints with each paper/developer combination, the resulting prints will not be representative of the best performance possible with some of the combinations. This is because the single negative chosen will be either too contrasty or not contrasty enough with some combinations, even though it may be ideally suited in density range to one or more other combinations. And if different negatives are chosen to make test prints that are matched to the specific density-range requirement of each combination, the differences in image content of each print will provide a poor basis for the comparison of the resulting prints.

TEST CONCLUSIONS

If you expected at the beginning of the article to learn which is the "best" paper/developer combination, the conclusion will be disappointing. Virtually all the combinations are viable and provide special performance characteristics that are advantageous to printing

specific images with specific negative characteristics. A photojournalist, for instance, may choose a combination that yields neutral tone coloration and maximum tone separation in light and midtones. A landscape photographer might make a completely different selection, opting for warmer image tones and a more uniform overall tone separation response. A photographer who specializes in a limited subject and has a definite image style might prefer to use only one combination for all printing, while a photographer with more eclectic interests and a flexible approach to technique would find it an advantage to use two or more combinations for his varied applications.

For myself, the tests were of great value in three different ways. First, they taught me not to apply the arbitrary prejudices of past individual experience to the selection of a paper for a particular application. Second, the data the tests furnished, including the specific negative density ranges required by specific paper/developer combinations, already are proving to be a great time- and material saver. But possibly most important, the experience of performing the tests and the resulting data have provided the key to including the selection of a paper/developer combination in the planning and previsualization of images yet to be created. □

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GREAT DOUBLE EXPOSURES THE LAZY MAN'S WAY

WITH COMPLETE
CONTROL IN-CAMERA

BY JIM ZUCKERMAN

Double exposures have fascinated photographers probably from the beginning of photography. Combining two images together to form a third image, often quite different from either of the two originals, offers endless creative possibilities. In the past few years, several camera manufacturers have incorporated into the design of their cameras mechanisms that facilitate making double exposures. For 35mm photographers especially, this new feature adds a new dimension to in-camera special effects.

There are definite advantages to creating double—or multiple—exposures in the camera. The primary advantage is that the highest resolution is retained. Since there is no need to make internegatives in the darkroom or use a slide duplicator to achieve the combined image, the double exposure produced in the camera is a first-generation original, not a copy. Therefore, it will as sharp as possible.

A second advantage of in-camera double exposures is the great savings

1. Infrared shot of butte was projected on stonework above a fireplace.

2. Skateboarder was projected through a hole in a piece of black paper to mask background; shell was originally photographed using black-light illumination.

3. These three images were combined in two different steps. First the pyramid (an infrared negative) was projected with a sunset shot, using a red filter, and the projection was photographed. The resultant slide was then projected with the photograph of the model, which had been shot at night with the flash placed behind her. Projector with the model shot was placed very close to the screen so that her image appears much smaller than the pyramid.

4. Black-and-white negative of dead trees above a lake was projected with sunrise over the Grand Canyon. Yellow and purple filters were used, respectively.

5. Cat's face was projected with color abstract that had been sandwiched with a model's face. No filters were used.





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EXPOSURES

in time. To produce a similar image in the darkroom would take a great deal of planning; many hours can be spent on one double exposure. A darkroom double exposure can also be more expensive, because it usually takes several prints before achieving an acceptable final print.

The one major disadvantage to in-camera double exposures is the lack of control. Since you are actually taking two original shots, it is necessary that both of the photographs be of good quality—in focus, properly exposed and composed, etc. If one of the images is poor, the entire double exposure will be ruined. A perfect example is a double exposure of a model and tree branches. If your shot of the model's face was taken just as she blinked, her eyes will appear closed or, worse, as though she's in a stupor. Obviously, this double exposure just won't work.

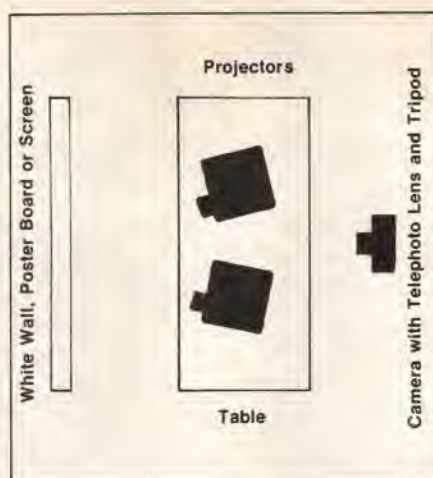
Unfortunately, your control over the entire operation sometimes is reduced to luck. There is, however, a method of achieving double exposures that eliminates all chance. In fact, you have optimal control. It is extremely efficient in terms of time and is very inexpensive. I call it "The Lazy Man's Way."

The only items required are a white poster board or untextured white wall, a tripod, many slides, and two 35mm projectors (get together with a friend and combine your projector with his). Place the two projectors side by side pointing toward the white poster board. When a slide is placed in each projector and projected onto the "screen," you have an instant double exposure! Now simply take a picture of the image on the screen.

The fantastic advantage of this method of double exposing is that you can see exactly what you have before you make the exposure. You can select the best of your shots and sit down in front of the two projectors and make a myriad of combinations. If some of the combinations don't please you, simply rearrange the slides in the projectors and look for new double exposures. When you find combinations that you like, photograph them right off the poster board or white wall.

DOUBLE EXPOSURES VS. SANDWICHES

Before we delve into some of the technical considerations, it is important that you understand the difference between double exposures and sandwiches. These two special effects are



DOUBLE-PROJECTION DIAGRAM

not synonymous. The only similarity is that two slides are combined to produce a new image. However, the results are quite different.

A sandwich is the actual placing together, surface to surface, of two (or more) slides. Usually, the two pieces of film are taken out of their respective slide mounts and remounted together in one mount. The result looks layered, as if one image has been overlaid on the other—which, of course, it has.

A double exposure is when two different images strike a light-sensitive material (film) at two different times. In our example of a girl's portrait and tree branches, first the portrait is taken; then, on the same piece of film, the branches are exposed (it doesn't matter which one is exposed first).

To illustrate how different these two techniques can be, let's look at a different example. Suppose one of the slides you are using is a silhouette of a person standing against a bright sky. The figure is dark while the sky is very light. The second slide is a macro shot of a red rose. If you now sandwich these two images together, the rose will be easily visible all around the silhouette—where the light sky permitted the rose to be seen. However, where the person is standing, the rose won't appear because the black silhouette blocked out the second image from coming through.

If you now double expose these two images (either successively in-camera or with the two-projector technique), the result will be very different. Where the sky and the rose are superimposed, you will see a washed-out area because the brightness of the sky floods that entire area with light. On the other hand, where the dark silhouette was you can now see the rose! In fact, the rose replaced the sil-

houette. Instead of a black form, you now see the person defined only by the red rose. This is because all black areas in the pictures—the silhouette, night sky, black pupils in the eyes—is unused, unexposed film. When light from another image hits that area, it is receiving its first exposure, while the area around it is receiving its second exposure.

THE TWO-PROJECTOR METHOD

The two-projector effect is exactly equivalent to the in-camera double exposure. Shadows take on the second image, while highlights tend to become lighter than they originally were.

One of the most important things to keep in mind when setting up the two projectors and your camera is that the projectors should be as close to each other as possible. It becomes quite obvious when you are actually projecting the slides on the poster board that there is a slight "keystone" effect; i.e., the projected images will not be perfectly rectangular but somewhat distorted. When the two projectors are placed perhaps several feet from each other while the slides they are projecting are superimposed over the same place on the poster board, this unwanted distortion is apparent. Therefore, be sure that the projectors are very close to each other (however, I don't recommend stacking them because it is too difficult to change slides in the lower projector), and make sure that the film plane of the slide is parallel with the projection surface. This also helps to eliminate keystone.

MAKING THE EXPOSURE

You must not forget to balance your film with the light source. Remember that projector bulbs are tungsten light and are rated at 3200°K. Therefore, for proper color balance you should use tungsten-balanced film such as Kodak Ektachrome 50 or 160 (I suggest the faster film). An 80B filter placed over the camera or projector lenses will also suffice when you have daylight-type film in your camera. If you are going to use a filter to correct the color balance, it is unnecessary to buy two of them (for both projectors) when you can just use one for the camera. However, the 80B will tint the picture you see in your viewfinder an unattractive bluish hue. This won't be seen in your final picture, but you should be aware of it. Many times I have studied the double image on the wall through that bluish cast and thought that the colors looked so lifeless and dull. When I lift my eyes from behind the camera and study the projected colors directly, it



6. The distortion effect shown here is called "keystoning" and occurs when projector lens surfaces are not parallel with screen.

gives me a much better idea of how the final shot will look.

You will find that your exposures will be quite long when copying the double exposures. Therefore, a tripod is really essential. Most of the exposures I use vary from $\frac{1}{8}$ second to perhaps four seconds. For steady, unblurred shots I always use a cable release. If you don't have one, simply use your camera's self-timer. It will be just as effective as a cable release.

You should be very careful when composing the projected images in your viewfinder. Because you are working in a dark room, it is very easy not to notice that you are not filling your frame with the double exposure. You will become so engrossed in the exciting images you're photographing that you won't notice that you can see in the viewfinder the edge of the double exposure. And if you can see the edge of the projected slide, that means you are going to photograph a little bit beyond that edge—and your frame won't be entirely filled with subject matter.

The only disadvantage of the double-projection technique is loss of resolu-

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EXPOSURES

tion. This is due to two things: First, the end result is a second-generation photograph; second, when you project the slide onto the poster board, it is being enlarged. When you rephotograph it, you are actually reducing this enlargement back down to 35mm. The best way to limit loss of resolution is to make the projected image as small as possible. In other words, you want a copying situation that is as close as possible to 1:1. By placing the projectors very close to the projection surface, you can keep the enlarged projection relatively small. A secondary advantage of this is that the image will be brighter (because the light sources are closer to the screen), and so your exposures will be shorter.

When taking a light reading, I simply use my camera's through-the-lens meter. If the light level is very low, and my camera meter won't give me a reading, I'll use a handheld reflected-light meter and take the reading directly from the projection surface. In this type of situation an incident reading (reading the light coming from either projector) won't work. For best results I always bracket each shot one stop over and under the exposure indicated by the meter. This is because the difference in light level between a 500-watt projector bulb and the light reflected from (and hitting) the screen is tremendous; also, the amount of light coming from each projector can be vastly different.

You will find the best position for the camera is on a tripod directly behind the projectors. If you place it in front of the projectors, the tripod legs will cast shadows on your screen. It is important also to keep the plane of the film parallel with the screen to prevent distortion. As I mentioned earlier, this applies to the projected slides as well.

SPECIAL EFFECTS

The remarkable thing about this double-projection technique is the amount of control you have over the final picture. By placing colored filters over the two projectors (for example, a red filter over one projector and a green filter over the other) you can change the entire feeling of the images. You can project a black-and-white negative with a color slide or combine a color solarization with an infrared shot. You could probably combine and recombine the various slides you now have and be content not to take another original



7-9. Photo No. 7 is a original silhouette shot, photo No. 8 an original flower shot. A projected double exposure of the two slides results in photo No. 9; note that flowers are visible through silhouetted figure, and background is a bit washed out.

10. This image is a sandwich of photos No. 7 and 8. Note how silhouette remains black and background is slightly darkened.

11. Projector on the left is being used to project vignetted image onto first image, which is accomplished by placing a small mask (piece of paper with small hole in center) in front of projector lens. Note the forward position of the left projector—this is in order to project a smaller image.

shot for the next five years! Once you begin this technique you will discover how many combinations there actually are. You will find it very helpful if you utilize some sort of slide-classification system—by subject matter—so you can take all your abstracts, for instance, and use them in combination with all your architecture shots. Or combine sunsets with portraits, or tree branches with animals, etc.

One of the many creative variations this technique offers is size control. If you want one of the images you're working with to be small, while the other is larger, you can simply place one of your projectors closer to the wall. When both slides are focused, one of the photographs will be considerably

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smaller than the other (see photo No. 3.) It will be necessary to vignette the edges of the smaller image, however, because you *don't* want to see, and photograph, the edge of the picture area. This vignetting can easily be accomplished by placing a piece of black paper in front of the lens of the projector that's projecting the smaller image. The paper must have a small

hole in it through which the slide will project. The hole size can vary, depending on how much of the image you want to show through. By placing the paper close to the projector lens, the edge of the cutout will soften, or become fuzzy, so that both images will blend together beautifully.

Another versatile method of manipulating images with this technique is

masking. You can actually use your hands or any opaque object to mask one or both of the slides. By placing your hand partially in front of the projector lens, you can block out any portion of the slide you wish. Into that darkened area is projected the second slide. With this procedure you can eliminate any part of a photograph—a bland sky, a cluttered background, unattractive shadows, etc.—and replace it with the other photograph simultaneously being projected onto the same portion of your screen. This enables you to have much greater control over any multiple-image combination.

It has been many a night that I've stayed up until 2 or 3 a.m., unable to stop the creative momentum that happens when using this exciting technique. I encourage you to experiment on your own, using your own slides, trying different variations of the technique. Use infrared film as your copy film, for example. Using a zoom lens, zoom during a 1/2-second exposure and blur one of your double images. Use diffusion filters, diffraction gratings, multiple-image prisms, textured poster-board material. I could go on and on, but I'm sure this will keep you busy for a very long time! □

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THE Y.O.B. SYSTEM

INTRODUCING A COMPREHENSIVE NEW APPROACH TO PHOTOGRAPHY

BY PARRY C. YOB

I want to warn you right here at the beginning that you are not going to be reading a rehash of the Zone System or a rerun of material gathered from manufacturers' literature. What follows in this and subsequent articles in this series may at times shock you with the changes it can make in your photography, but at each and every step you will be given the opportunity to verify the accuracy of the new methods I will disclose. For some this may mean giving up cherished rituals and excuses for past failures, but the Yob System has been designed to yield the best possible product by using modern emulsions and modern roll-film cameras to their optimum performance. The system is fast, accurate and fool-proof, and it does not require corrections, special processing for differing light conditions, or keeping field notebooks for application. Once you have made the initial calibrations, you will have to do nothing more than point and shoot, regardless of whether you are using black-and-white, color slide or color negative film.

Since the system is entirely new, it can be expected to be controversial, and readers are invited to write to me with questions. In the final article in this series I will answer some of the most frequently asked questions, and for those readers who send along a stamped, self-addressed envelope, less-frequently asked questions will also be considered. Just address your letters to "The Yob System," care of PhotoGraphic Magazine.

Since most readers cannot be expected to be familiar with the technical terms of sensitometry, much less own densitometers, the initial articles in this series will stick to terms and methods that can be applied by anyone who owns a camera and has access to an enlarger. However, one article in the series will be devoted to the use of Yob System techniques with laboratory instrumentation.

BASIC CONCEPT

The basic concept of the Yob System is to simplify all the interrelated



1. This symbol is the trademark of the Yob System and is designed for use as a memory jogger for those who might have difficulty keeping the important factors in mind when first learning about the system. The big O in the middle represents the zero point to which all modern camera metering systems are adjusted, and the significance of the other letters will be explained in this and subsequent articles on the Yob System.

steps from exposure to final enlargement so that the photographer can devote his time in the field to the taking of as many pictures as possible in the shortest possible time. Time and again I have lost picture opportunities while making the necessary meter readings to apply the Zone System or recording the data necessary to guide the later processing of film. I needed a much faster system, but simply accepting the manufacturer's film-speed ratings and processing times reduced my product to a level I could not tolerate.

To work my way out of this situation, I have spent the past four years conducting experiments and designing a system that will produce the best possible quality any enlarging paper is capable of producing with any given en-

larger. Surprisingly enough, in most cases this requires the production of a negative that differs considerably from the manufacturers' recommendations for their films and papers. The manufacturer is bound by ANSI rules and methods and tries to guess what the "average" enlarger might be like, but in truth there is no average. For you there is only your own camera and your own enlarger, and whether you use sheet film in a big professional view camera or an automatic 35mm single-lens reflex, shooting for the average means shooting for the lower mediocre level at best.

However, by making a few simple Yob System tests for yourself, you can adjust your exposure and development techniques to perfectly match the particular enlarger and paper you are using, once and for all. Most important, you will be dealing with absolute values, not some vague reference to reading newsprint through the highlights of your negatives or such vague terms as "detailed highlights" or "detailed shadows."

Although I use no less than a dozen kinds of film and as many cameras in my daily work, the negatives and transparencies from these eventually find their way into one of my enlarging systems, so the first step in the Yob System was to determine what was the optimum negative for my particular equipment.

ENLARGER CALIBRATION

To avoid the confusion introduced by the aesthetic values of some favorite negative, I first designed a preliminary standard, using sections of Kodak neutral density filter, the accuracy of which is excellent. (Kodak Wratten Neutral Density Filter No. 96 [gelatin film] is available in two- and three-inch squares. The catalog number for a three-inch square of .10 density filter is 149-6314, the .30 density catalog number is 149-6330, the .90 is catalog No. 149-6397, etc. Densities are available from .10 to 4.00. Refer to the current Kodak photographic products catalog for prices and catalog numbers for oth-

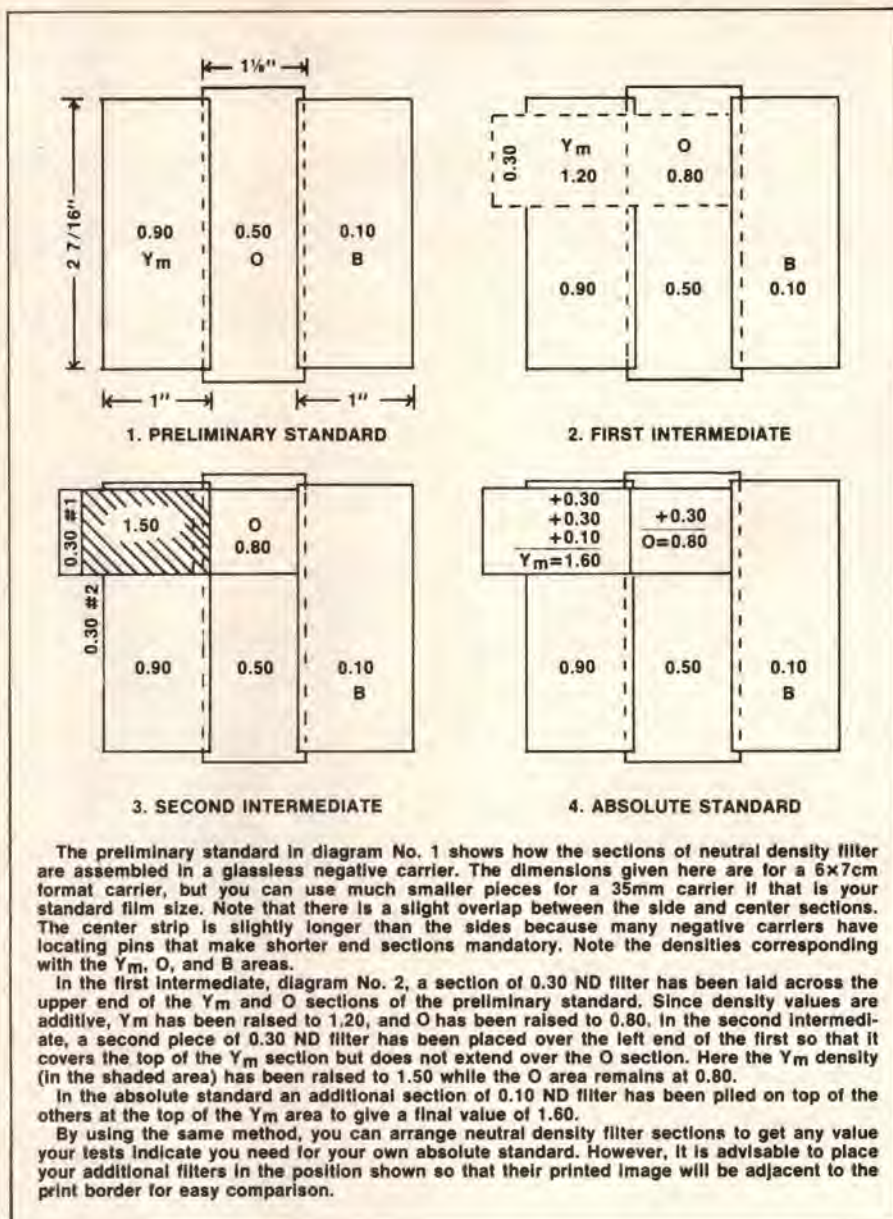
Y.O.B. SYSTEM

er densities.) These were arranged as shown in diagram No. 1, and held in a glassless negative carrier. Since the 6×7 format is a fair compromise between my minimum 35mm-size negative and my maximum 8×10-size negative, and because the No. 96 ND filters are not available in sizes larger than three inches square, I chose this size for all my enlarger calibration work. If your enlarger only goes to the 2¼×2¼ or 6×6 size or is even limited to 35mm films, it is an easy matter to size your strips of filter material in proportion.

Since the technique that follows is unique, I want to point out that this technique and those to be described in subsequent articles have been verified through use of a high-precision digital-readout densitometer, and this instrument was also used to verify the excellent quality and accuracy of Kodak's Wratten Neutral Density Filters No. 96.

The ideal negative should have a range of densities just sufficient to utilize the maximum range of tones available in the enlarging paper. That is, the resultant print should have some area that is the darkest black the paper is capable of producing, and it should have some white area that is the whitest white the paper base is capable of reflecting. The negative range should be adjusted to yield this black and this white with a "normal" grade No. 2 paper or the No. 2 filter for variable-contrast papers. It must give these values with your particular enlarger.

Since I had no idea what my enlarging systems required, I based my preliminary standard on an estimate in order to have a point of departure. Obviously, a negative that combined clear film base with a totally opaque area would meet the criterion of maximum black and a maximum white, but such a negative would be relevant only in the lithographic reproduction of line drawings, not in continuous-tone photography. To hold the exposure times to the minimum allowable for the highest quality print possible, the maximum density should be kept to the lowest level that will produce the finest print possible on normal grade paper without the use of dodging or burning techniques. The term *density* will be dealt with on a technical basis in a later article, but for now it is sufficient to say that the greater a negative's density, the more opaque it is, and the greater the printing exposure it will require. The greater the density, the

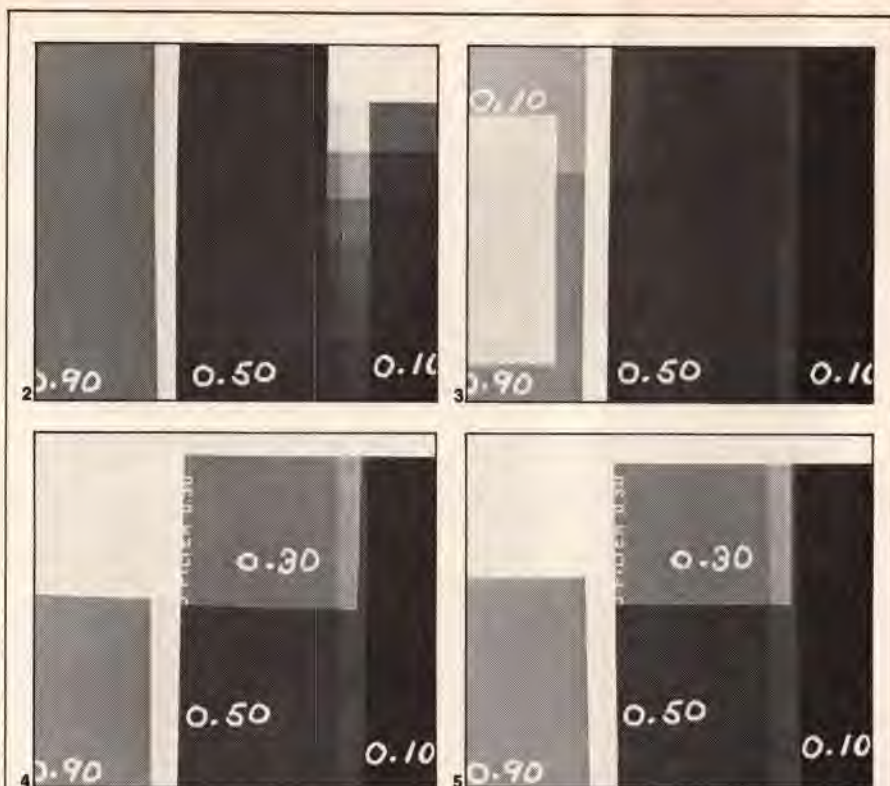


higher the value. A density of 0.00 is the lowest possible value for a clear film base, and a density of 4.00 is the maximum measured by most laboratory instruments. In a practical sense, black-and-white negatives with important highlight densities higher than 2.50 are difficult to print, but small specular highlight densities may go much higher. Therefore, it is desirable to keep the maximum important highlight density as far below 2.50 as is consistent with excellent quality.

The difference between the maximum and minimum densities is a measure of "contrast," and the minimum density of a negative is a property of the base, emulsion, and development. The minimum fog-plus-base density for most modern films is .20 or less, and manufacturers recommend total density range differences of .80 to 1.05 for normal grade No. 2 papers. The larger value is recommended for diffusion en-

largers and the smaller for condenser enlargers. However, because there are so many different enlarger optical systems and so much variation in systems of the same general type, it is highly unlikely that your particular enlarger will give anything near to optimum performance with negatives of these ranges. For the purpose of the Y.O.B. tests, all condenser enlargers will be considered in one group and all diffusion enlargers, including cold-light enlargers and dichroic heads, will be lumped in the other. The tests will ferret out the differences, if any, between the various diffusion systems.

For a condenser enlarger the recommended density range is .80, and if we add an anticipated minimum base density of .10 to this, we find the required highlight value, which is .90. Using the same logic, the ideal highlight value for a diffusion-enlarger negative should be 1.15 or 1.20. However, these ranges



2. This is the initial test strip wherein the B area was given a series of exposures that varied by ten seconds each to find the exposure needed for the maximum black. The remainder of this photo got the total of all of the exposures given to the sections of the B area. The B area is the one marked 0.10 at the right.

3. It was determined in photo No. 2 that an exposure of 50 seconds at f/22 gave the B area the maximum black, but this resulted in a Y_m area that printed a dark gray instead of the desired white. Here a section of 0.30 ND has been placed over part of the left side of the Y_m area, and an additional piece of 0.10 filter has been placed so that it overlaps part of the 0.30 area and part of the 0.90. This gave density values of 0.90, 1.00, 1.20 and 1.30 on a single print for comparison, but in no case was the density high enough to yield a border white when the B area was printed to the maximum black.

4. This corresponds to a print from the second intermediate in diagram No. 3. The first 0.30 section has been laid over the top ends of both the Y_m and O areas, and an additional section of 0.30 ND filter has been placed over the upper end of the Y_m area, giving the total values indicated in the second intermediate of diagram No. 3. Although the magazine's reproduction may not show it, the Y_m top area is still a faint gray and not yet the required border white.

5. This corresponds to a print from the absolute standard in diagram No. 4. An additional section of 0.10 ND filter has been placed over the upper end of the Y_m area, and it now prints essentially a border white.

can be taken only as preliminary starting points. We will adopt their numbers and choose a synthetic base density of .10 together with a synthetic highlight density of .90 for initial tests. Sections of neutral density filter reflecting these values are assembled as the preliminary standard shown in diagram No. 1.

Since all camera metering systems and all handheld meters are based on an average light value reflected from a surface having about 18-percent reflectance, our preliminary standard or synthetic negative should have some average or middle value as well. This is our true zero value of the "O" value in the Yob System, and for the preliminary standard this is taken as the average between .10 and .90, which is .50. We now have preliminary sections corresponding to the three important values of the Yob System, which are Y_m, the maximum density; O, the average density; and B, the base or black density.

The letter "Y" was borrowed from the electrical engineers who use the term "Y-potential" to describe the potential electrical difference between points in a three-phase system. Thus our preliminary Y-O-B values are: Y_m = .90, O = .50, and B = .10 for a condenser enlarger.

PRELIMINARY TESTS

Before inserting your preliminary standard in your enlarger, you should place a negative of your chosen size in the carrier and carefully focus the enlarger for the size enlargement you expect to make most often. I placed a 6×7 negative in the carrier and focused for an 8×10-inch enlargement with the image slightly overlapping the easel blades as it normally would. Once you have the enlarger head in the proper position, mark the column of the enlarger with a permanent mark indicating this position, because you will be returning to it in the future.

The purpose of the preliminary tests is to find out how your enlarger compares to the "average" enlarger. In these tests you should use the manufacturer's recommended paper developer at the recommended dilution for the recommended time and temperature. If you are already using factor development as a means of eliminating variations caused by temperature, solution exhaustion, etc., you can use factor development as a substitute. In no case should you use additives such as potassium bromide, benzotriazole, etc., during the preliminary testing!

With the preliminary standard in the enlarger, make a test-strip exposure of the B (.10) side of the image (see photo No. 2), using times of 10, 20, 40, 80, and 160 seconds at f/22, or half those times at f/16. Two or more of the steps on the test strip should have the same maximum blackness when developed. If not, increase the exposure times until two or more adjacent steps exhibit the same maximum blackness. If you are using single-weight paper, hold the wet paper up to the light and view the test strip by transmitted rather than reflected light. This will allow you to see differences that cannot be seen by reflected light. When two or more sections have the same maximum density, start reducing the time given to the one that had the least exposure until you get a test strip where you can just see the first slight difference between the maximum black step and the one next to it. The time given to this segment of the test strip is the minimum exposure required to produce the maximum blackness or reflection density of which the paper is capable. This, then, becomes your basic test exposure time. Record the time and f-stop in a permanent Yob System notebook, because you'll be using them again!

Now place a full sheet of enlarging paper in the easel and give this the basic exposure. Develop the same as you did for your test strips. Compare the black section of the full print to the maximum black of the test strip to make sure that processing the full sheet has not introduced some subtle change. You should be using at least 36 ounces of fresh paper developer in an 8×10 tray. If you still have your maximum black, examine the lighter Y_m .90 section of the print to determine if it is as light as the unexposed margin of the print.

My own results with an Omega D-2 and an Omega D-5 condenser enlarger surprised me greatly at this point.

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Clearly my enlargers were not "average" condenser enlargers because no amount of juggling would give me a maximum black and a minimum white with these preliminary densities! With my enlargers and my lenses, I could not get a full paper capability with an .80 density difference or a total range of .10 to .90. In spite of this, I recommend that you start with the same preliminary standards as I did so that in later use of the Yob System you will have no reason to worry that you somehow cheated yourself in not doing your own testing and instead took my word for what "would have happened" in your tests.

TRIAL ADJUSTMENT OF THE PRELIMINARY STANDARD

Examine the Y_m section of your final print from the preliminary standard and make your best guess as to how many stops you will have to close the lens to reduce the exposure to where that section will print as white as the margin of the paper. If it appears that a one-stop reduction in exposure will give you a pure white, reduce the f-stop one notch and expose a full sheet for the time used above. If the processed print gives a Y_m section as white as the border, try reducing only $\frac{1}{2}$ stop. If your lens aperture won't go smaller, remember that reducing the exposure time by $\frac{1}{4}$ is equal to a $\frac{1}{2}$ -stop reduction, and reducing the time by $\frac{1}{2}$ is the equivalent of closing the lens one full stop. If in doubt, simply slip a section of .30 ND filter over the .90 section as seen in photo No. 3. A .30 density change is the equivalent of one stop. In the unlikely event that your enlarger gave a complete white with the preliminary standard when the B section was exposed for the maximum black, you will of course have to start increasing the exposure by half-stop intervals until you can just see the first perceptible difference between the Y_m section and the unexposed print border. In this case pay no attention to the B section, since it can get no blacker.

Once you have determined the f-stop change required to adjust the Y_m area to the white of the print base, multiply the difference in f-stops by .30 to determine the density change that will be required for adjustment, and lay strips of ND filter as shown in diagrams No. 2 and 3 and photos No. 3 and 4, then with the f-stop reset to the value you used in the beginning and using the same exposure time required for the B

section to print maximum black, make another print to see if you have actually gotten a border white in the Y_m area of the print.

Neutral density gelatin filters come in increments of .1, and values are additive. Therefore, if we place a .30 on top of the .90 filter, we will have a total density of 1.20, etc. If we need to add .45, we can either use .30 plus .10, which totals .40, or we can use one thickness of .30 plus two thicknesses of .10 for a total of .50. In practice an error of .05 will not be critical, but if we lay the filter sections together so that all of the .30 section is covered by one section of .10 and half is covered by the additional .10 section, we can have totals of both .40 and .50, which bracket the desired value of .45.

The addition of .30 to the Y_m area did not give me a border white, as can be seen in photo No. 3, and adding a .10 section on top still failed to do the job. I therefore placed one section of .30 completely across the Y_m and O sections of my preliminary standard and then added another section of .30 to the pile in the Y_m area so that I now had a total of 1.50 over part of the Y_m section and a total of .80 over part of the middle or O-section. This is seen in photo No. 4 and diagram No. 3. This did not quite give me the required border white in the Y_m area so I added another .10 filter to the stack for a total of 1.60 and got my maximum white when the B section was exposed for maximum black. Since the total of .80 was very close to the average between the .10 B section and the 1.60 Y_m section, I settled for using this as the O-area of my final, *absolute standard*, as seen in diagram No. 4 and photo No. 5.

There will be more about the selection of the O-section density later, but first let's consider the possibility that your original preliminary standard had too great a density range for your enlarging system. That is, a Y_m density of .90 combined with a B density of .10 resulted in a maximum black and a border white on your first trial print. In addition, opening the aperture or increasing the exposure time continued to yield the border white until you had increased the exposure by one full f-stop or 100 percent in time. It is a peculiar fact that you must increase exposure time by 100 percent to be the equivalent of opening the aperture one stop, but you only have to decrease the time by 50 percent to be the equivalent of closing it one stop. In any case you had to make a one-stop

increase in exposure before the Y_m area began to get darker than the border. Since one stop is the equivalent of a change of .30 in density, you must decrease the density of the Y_m section by .30. Subtracting .30 from the original .90 leaves .60 as the Y_m area of your absolute standard.

At this point, if you have done everything correctly, you now have an absolute standard that provides you with prints having a maximum black and a paper-base white on normal grade No. 2 paper. You have reserved all the changes in paper grade for darkroom emergencies where they belong. You know exactly what your enlarging system and paper require to utilize the last bit of paper quality, and you forever have your own final absolute standard. At this point you should make drawings similar to diagrams No. 1-4 and permanently record the actual values of the filters used. I used a fine-point Rapidograph pen and film-type ink to mark the values of the densities of the various filter sections I used in making up my standards; and although the prints are not pretty, the filter densities are printed on the actual photographic print for record purposes. It is also a good idea to mark the back of the print with the make and grade of paper on which it was made as well as the exposure time, f-stop, developer type, dilution, and development time. I use a bound notebook for recording other Yob System information so that when combined with properly identified prints, the data remains useful long after memory has failed.

To make the final absolute standard useful in terms of the real world, you should now adjust the "O" or zero filter value to the mean or average value between the Y_m and B densities so that the Y-potentials will be equal. To do this you simply add the B density to the Y_m density and divide the sum by 2. In my final standard the Y_m was 1.60, and adding .10 to this gave 1.70, half of which was .85. Since placing a .30 filter over the top of the .50 center of the old preliminary standard gave a total density of .80, and a difference of .05 is not critical, I left my O section at the .80 value.

INTERPRETING THE ABSOLUTE STANDARD

For those who have read article after article explaining how to control the excess contrast in photographic scenes, and for those who have been buying chemical additives to control contrast during negative development, the Yob System must by now seem to-

tal madness. Most readers will have conducted their own tests and verified that most enlargers require, by the Yob System, a much greater density range than that suggested by film and paper manufacturers, and almost wildly beyond the values suggested by the makers of chemical additives. At this point I could go into a long explanation about the fads and politics of photography, but instead I urge you to emancipate yourself from all the folklore, alchemy and old wives' tales that bind you to the status quo and continue to conduct and interpret your own Y-O-B tests for yourself. Photography is not a religion, and you can't be sent to eternal damnation for checking things out for yourself rather than accepting previously published material on faith alone. With this outlook let us interpret what we have discovered so far.

We know that one f-stop is the equivalent of a change of .30 in negative density, and our absolute standard now ranges from about .10 to 1.60 with the density difference being 1.50. Dividing 1.50 by .30 we find that the difference is five stops, which really isn't very much when we consider that the older Zone System deals in terms of scenes with ranges of nine to ten stops. We have found for ourselves that to utilize the maximum capabilities of our No. 2 paper, we need a five-stop density range in our negatives, and at first glance it would appear that we might have problems compressing a ten-stop outdoor scene into a five-stop negative required by our standard. However, if we examine Kodak literature, the matter becomes even worse. Kodak recommends a range of .80 in density, or only 2.7 stops in a negative suited for condenser enlargers, but there is a catch. Kodak talks about those diffused highlights and detailed shadows for which there are no absolute values, while we are dealing with *absolute* values, which can be pinned down and tested in our own darkrooms! With the print from our final absolute standard in front of us, and tests we made for ourselves, we need not question the results, but it is clear that there are great differences between the ten-stop exposure range mentioned in older systems, the 2.8-stop density range suggested by Kodak, and the 5- or 5.3-stop range indicated by our own tests.

Fortunately, as will be pointed out in later articles, the issue is not nearly as difficult as it seems. A combination of factors from camera flare to film characteristics work together in an additive

manner and balance out what might otherwise be an impossible situation. These factors, together with the skills of the emulsion chemists, make it possible for us to operate at zero latitude when the chips are down and yet have films that yield acceptable results with remarkably sloppy techniques. From our absolute standard we know that we do require the five-stop density range in our negatives, but you may have overlooked the fact that this is based on the absolute minimum enlarging exposure required to obtain the maximum black from the thinnest or least-dense part of the negative. Thus the increased density range will not in any way increase the exposure time required for the perfect print. In short, we have not sacrificed anything in terms of printing time or paper grade in the design of this standard.

For those few who own densitometers, it would be an easy matter to go through stacks of old negatives looking for the rare ones that have density ranges of 1.50, but I suggest you refrain because the aesthetic values of such negatives could easily confuse and mislead you. So, in turn, could any attempt at this time to relate stepwedge densities to the Yob System, but in the next article I will introduce you to the construction of the Yob System Evaluator, which avoids the confusion of aesthetic considerations with technical factors.

The evaluator is constructed so that it automatically adjusts to the requirements of all modern metering systems. It is forward-looking enough to work with color, electro-optics systems, and the nonsilver emulsion systems of the future. The evaluator is so simple to construct that anyone capable of loading a roll-film camera will have no trouble building one with tools to be found in any household. For those deeply interested in the technical end of photography and sensitometry, the beautiful and solidly based relationship among the evaluator, the absolute standard, and sensitometric techniques will be discussed in a special technical article later in the series. However, the nontechnical reader need have no fear that he must read and understand the technical article in order to be able to use the basic Yob System.

Again, since this series introduces a whole new system of photography, it is anticipated that there will be a considerable number of reader questions generated, and I urge you to feel free to send them along to me, as detailed in the beginning of this article. □

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Technical Data:

Aperture Range: 1/3.5-1/22

Construction:

14 elements in 10 groups

Coating: Sigma Multi-Layer

Angles of View: 30°—12° Diagonal,

25°—10° Horizontal,

17°—7° Vertical

Min. Focus: 42cm (16.5") from front element;

66cm (26") from film plane

Field Size at Min. Focus:

96 × 144mm (3.8 × 5.7")

Maximum Magnification Ratio: 1:4

Diaphragm: Fully Automatic

Lens Hood: Screw-in, supplied

Filter Size: 62mm

Dimensions: 71 × 176mm (2.8 × 6.9")

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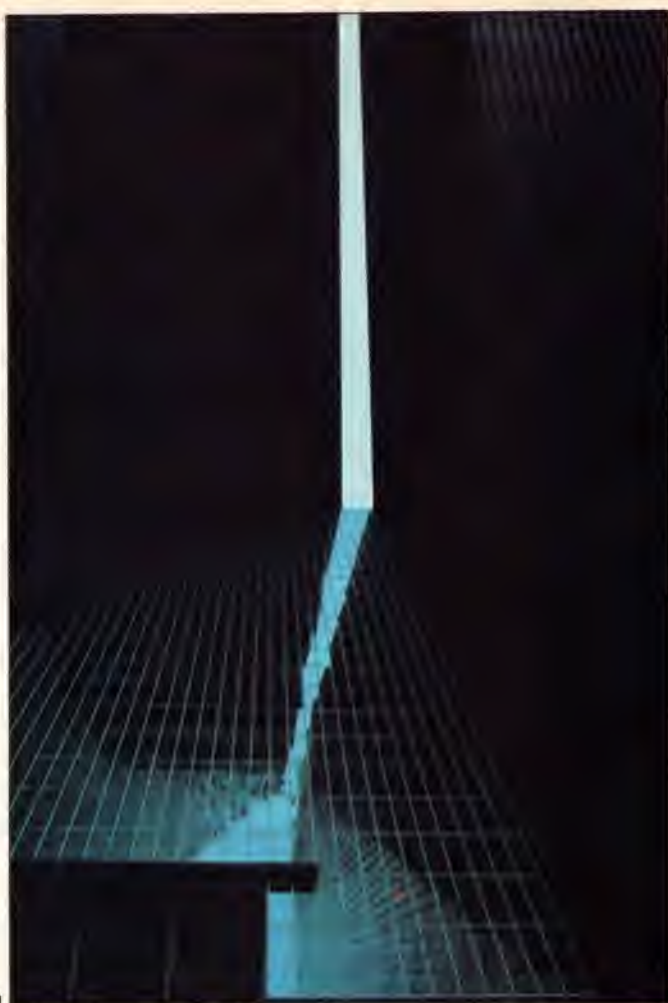
1. Jim Kuykendall used Kodak High-Speed Film Infrared to highlight branch detail in this photograph. Shot was taken with a Canon AE-1 camera and 28mm Canon FD lens; exposure was at 1/11 for 1/60 through a red No. 25 filter to aid infrared effect.

2. Shooting at sunset allowed Peter Donahoe to capture rich, subtle tones in forest. Shot taken with a Nikon F camera and 50mm f/2 Nikkor lens on Kodak Plus-X Film at 1/11 for four seconds.

3. An already surreal subject is made even more so by the use of Kodak High-Speed Infrared film. Richard Kline used a Nikon F2 with 24mm Nikkor lens to expose the image at 1/16 for 1/125.



3



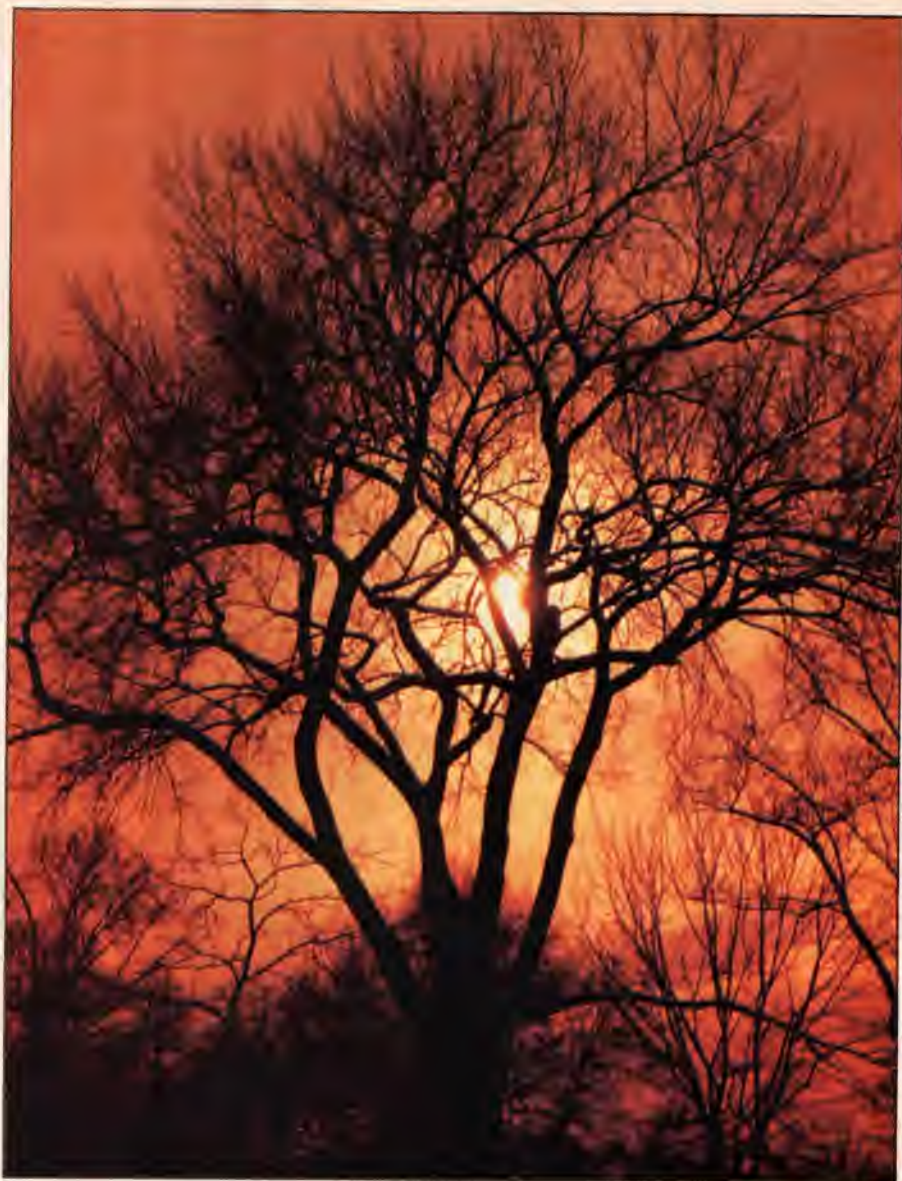
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2



GALLERY '79



1. Marvin King isolated this starkly elegant segment of Pennzoil Building in Houston, Texas using a Nikon F2 camera with 28mm Nikkor lens. The exposure was made on Kodak Kodachrome 64 Film at $f/11$ for $1/60$ (no filters were used).

2. Serenity seems to flow from this photograph by Wayne Norton like the Middlebury River in Vermont, which is its subject. He used a Nikkormat EL camera with 105mm Nikkor lens to record image on Kodak Kodachrome 25 Film; exposure information was not recorded.

3. Michael Rosen made good use of studio lighting and background to set off anthurium flower. Kodachrome 64 film was exposed in a Canon F-1 camera with a 100mm $1/4$ Canon macro lens at $f/11$ for $1/60$.

4. Carl Schlesinger's "Portrait of a Tree" in New York's Central Park was photographed on Kodak Ektachrome 64 Film (daylight) using a No. 85 tungsten conversion filter to create warm sky tones. Shot was taken with a Fujica ST801 camera and 50mm $1/1.4$ Fujinon EBC lens; exposure was at $f/8$ for $1/125$.

5. Alan Levenson chose the moment between sunset and moonrise to photograph Zabriskie Point in Death Valley, California. He used a Bronica ETR camera and 150mm Zenza Bronica lens to make this exposure on Kodak Ektachrome 200 Film.



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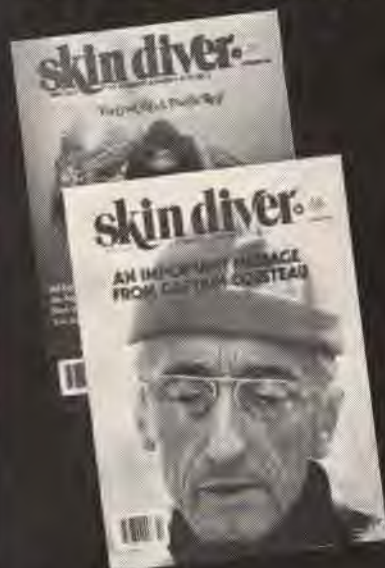
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□ Any idea why motion picture projection booths had heavy fire doors and automatic shutters on the peepholes through which the film was projected? Or why projectionists once made such good wages? The answer to both questions is the same—nitrate film. A first cousin to nitroglycerine and all that good stuff, nitrate was the most successful and durable of all the film stock materials manufacturers could devise in the early days of the movies. Besides producing negatives and prints of amazing clarity and brilliance, it had all of the best qualities required of a good film base. Extremely flexible, it held the emulsion well and remained flat during processing. In fact, there was only one little thing really wrong with nitrate stock—bring it near a spark, open flame or extreme heat and it would burn like crazy!

For that reason it was finally (although reluctantly) phased out of use in 1951, even though a few producers felt that its virtues outweighed the risks. Some still hold it up as the standard against which all other film base materials must be compared and find modern safety bases lacking in comparison. However, nitrate had a couple of other minor faults—it shrank as it aged, and it could (and does) self-destruct. The best recent example was the devastating fire at the International Museum of Photography, which resulted in the loss of a great many original negatives of classic motion pictures that had been filmed on nitrate stock. Still unexplained, the fire took place in a nonair-conditioned barn in Rochester, New York during 85°F. weather. So what does this have to do with collectors in general? Well, if you happen to have still negatives or movie prints on nitrate film, you could have a time bomb on your hands.

It's true—Kodak only made 35mm movie film on nitrate base. But that doesn't mean that those who do not collect old movie film can rest easy—repackers and reslitters furnished much nitrate film to still photographers. This means that many who used the so-called "short ends" from Hollywood studios might well have nitrate negatives lying in an album or stored in cardboard boxes in the attic. So what's a short end? It's the amount of unexposed film remaining on a 400-foot roll of movie stock after the day's shooting is finished. "Converters" buy short ends to reload into 35mm cassettes and sell as inexpensive 35mm film for still cameras. You see it advertised these days as various emulsions of Eastman Negative film, but in the old

VINTAGE VIEWFINDER

KALTON C. LAHUE

THE DANGER OF SHORT ENDS

days (prior to 1951) it was very popular to buy reloaded short ends either as private-brand or mail-order merchandise. After all, who could resist buying an 18-exposure roll for 30 cents when Kodak was asking 35 cents for what appeared to be the same emulsion—usually Super X? Not surprisingly, few photographers of the era knew exactly what they were buying. Since it was often advertised as "surplus," most thought it to be war surplus. As far as I know, color



This 1913 shot of movie star Kathlyn Williams still retains an amazing clarity, but the nitrate negative has long since disappeared.

film on nitrate base was never made available by this route—the processing techniques of the day did not lend themselves to developing short ends of color film.

Now to answer a logical question—what's wrong with a small amount of nitrate film? Nitrate stock can and does combust spontaneously. Since the possibility of a self-generated fire is great at temperatures above 100°F., nitrate stock should never be stored at higher than 70°F.—and when was the last time your attic was that cool? As nitrate stock ages, it becomes potentially more dangerous. A froth begins to appear on it, then the images gradually disappear. Finally, the film becomes little more than a fine brown powder—for all practical purposes it turns into a sort of deadly dust bomb.

Once ignited, it's all but impossible to put out the fire, as burning nitrate film generates its own oxygen. That was the reason for the heavy doors and automatic window shutters on projection booths of the era—to close off the booth in case of fire. Since burning nitrate stock feeds its own flame, your handy fire extinguisher (foam or water) is useless, and so is a wet blanket. Interestingly, nitrate film doesn't burn particularly hot, just fast—up to 15 times faster than most other fuels. It leaves little trace, only a small ash. But the worst is yet to come—the burning film stock releases carbon monoxide, which combines with nitrogen oxides to form a lethal and insidious gas; those exposed to it can die days later for no apparent reason. Now you know why old-time projectionists were paid so well for their work!

How can you tell if you have nitrate film around the house? First, look at the edge. If it's safety-base film, it will *probably* say so. All Kodak film is so marked, but occasionally a "converter" may have slit a smaller film size from a wider roll, removing the edge mark in the process. To be absolutely certain, drop a ½-inch piece in trichlorethylene and agitate the liquid. Safety film will float; if yours sinks, get rid of it!

But how do you get rid of it? And what if you want to preserve what's on it? As I've just explained, you can't burn the stuff safely—and don't throw it in the garbage. To dispose of it properly, call your local fire department, tell them what you have, and let them take it from there. Preserving the images on the film may be more involved. The only solution is to copy it, but duplicating movies can be both costly and difficult to get done, since few labs are equipped to handle nitrate film these days. For still pictures, you can make high-quality prints and copy them if you need a negative. You'll find the various processes outlined in any good book on copy techniques.

Is any film absolutely safe? Well, all films will burn, but you really have to try with safety-base materials. The one film size that's probably the safest is super (single) 8, as it came out after nitrate materials were long gone. Those interested in storing film in the safest and best conditions can drop a line to Eastman Kodak, 343 State Street, Rochester, New York 14650, along with 30 cents, and ask for the following pamphlets: No. AF-7, Storage & Care of Kodak Films in Rolls (10 cents); and No. D-23, Handling & Storage of Kodak and Eastman Motion Picture Films (20 cents). □

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☐ Fifty-two "Camera on Campus" columns ago, I wrote that the Photography Instructors Association (now the National Photography Instructors Association) boasted a membership of 43 high school teachers and a few college and university instructors, mostly located in the Southern California area. Next month, from March 8-11, the NPIA will be attracting many of its current 450 members nationwide to the impressive, castlelike Sheraton Hotel in Anaheim, California—home of Disneyland, the Angels and the Rams—where its first national conference is to be held.

Conference cochairmen Bill Wittich and Tony Freeman have planned events that will offer all instructors something practical to take back to their classrooms. Wittich points out that the NPIA membership reflects a wide range of areas and interests, representing photography instruction in the arts, journalism, commercial and related areas. "Our members are concerned with familiarizing their students with the composite world of photography, allowing them to drift naturally into the area of their interest rather than insisting on a specific or one-sided direction. The conference will follow that concept of bringing many elements of the photographic profession together at one time and place.

"Among our speakers will be Ansel Adams (health permitting), a photographer from *National Geographic*, a museum curator, a number of successful commercial photographers and some outstanding photo educators. But the difference between this and other photo-related conferences is that every speaker will be talking about photo education and how to use the information in the instructors' classrooms. The photography educators on the program will be sharing their ideas for successful programs at both high school and university levels. It is this sharing that has made NPIA work in the past; it is this sharing philosophy that will be expanded at the conference.

"The four-day conference schedule will encourage frequent opportunities for teachers to get personally acquainted, such as the opening student print exhibition, FOCUS '79; wine-tasting with the speakers; coffee breaks; trade exhibits and an awards banquet. Special activities will include a multiimage slide festival, screening of educational films, and a competition of student-produced slide/tape shows. While all of the events mentioned are in themselves important, the real key to the success of this national conference will

camera ON CAMPUS

ROBERT ROUTH

NPIA TO HOLD FIRST NATIONAL CONFERENCE

be the individual instructor who shares with another his concerns about programs, problems and solutions in his school situation."

Wittich also serves as current president of the Southern California chapter of NPIA, and he is typical of the hard-working, involved members of this growing organization. I would like to mention some of the others whose energies have influenced the dynamic quality of NPIA: first, the executive board members because they



Ansel Adams, scheduled speaker at the First National NPIA Conference.

have invested an unusual amount of talent, time and energy in shaping the core of what promises to be a lasting organization dedicated to the needs of the photo teacher. Original executive board members Tony Freeman, John Johnson, Phil Sopocko and myself have recently been joined by Marvin Inouye and Allen Kuhlrow. Ben Makuta, National Treasurer, and Pierre Odier, Projects Coordinator, round out this group, which has shown a talent for organization and imagination that will ensure the continuing success of NPIA.

Executive board meetings, often held twice a month, are intensive and at times unpredictable. Hours of serious business can be followed either by a massive attempt to correct and update a mailing list that won't stand still, or by the sorting of names for mailings—as finances permit—to photo educators who have not yet heard of NPIA. There is a great willingness to help each other, and at times, after an especially busy week, a great weariness.

Although NPIA enjoys a very large

membership of high school photography teachers, and even though this direction was somewhat intentional in order to provide a voice for the level of photo education that seemed in greatest need to be heard, the Association always welcomes educators at all levels. Indeed, members of the executive board reflect different levels of education.

Special mention must also be made of the vision and work of Tim Brehm, past president of the Southern California chapter, who was instrumental in assisting in the development of a strong New York chapter. Much of this success was brought about through the cooperating efforts of Ann White of the International Center for Photography (ICP) and Neil Rothman, current president of this chapter, which already offers a strong program and a large group of enthusiastic members. Efforts are underway to begin a chapter in the Chicago area; other chapters are soon to follow.

The dramatic increase in the quality of the last two quarterlies of *The Photo Instructor*, prepared by Tony Freeman and Phil Sopocko (recent quarterlies have been edited on a rotating basis by executive board members), reflects the effect of advertising support from the Eastman Kodak Company. And speaking of manufacturer support, NPIA acknowledges the timely financial aid from Larson Enterprises (Reflectasol) for needed seed money for the conference.

NPIA's FOCUS show has become one of the largest and finest student exhibits in the nation. Any students currently enrolled in high school or college are eligible for participation. A jury of highly competent photographers and photo educators judge and select for hanging entries divided according to level of student education. Plaques and certificates of merit are awarded at the FOCUS Awards meeting. FOCUS '79 will be exhibited at the national conference in Anaheim, at the beautiful Pacific Design Center in Los Angeles, and in New York City. Students interested in entry forms should send a self-addressed, stamped envelope to the address below.

Mention should also be made of a continuing program offered NPIA members, the "Summer Abroad Program," whereby instructors travel, expense-free, as student advisors.

For further information concerning this growing association of photography instructors, write the National Photography Instructors Association (NPIA), Photography Area, California State University Long Beach, Long Beach, California 90840. ☐



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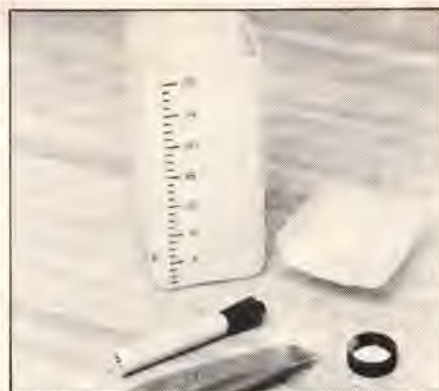
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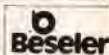
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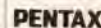
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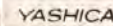


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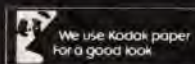
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☐ This question may sound stupid to you, but I would like to know the difference between a contact print and a print-out proof. You see, my son is just getting into photography, and a friend of his suggested that he make proofs or contact prints from his negatives. Any help would be greatly appreciated.—Doris Rosen, San Diego, California.

Doris, both contact prints and print-out proofs are a form of printing in which the negatives are in contact with a sheet of photographic paper for the purpose of making a positive print from a negative image. There are two basic types of photographic material used for making positive prints from a negative: print-out emulsions and development emulsions. The primary difference between the two is that the printing-out emulsions permit the formation of an image without development. Development emulsions require the development of a latent image before a positive image can be observed.

What this means simply is that with a contact print you have to go into the darkroom, mix chemistry and expose and develop a print to get your proof sheet. With print-out paper such as Kodak Studio Proof Paper, you need only to place the negatives in contact with a sheet of paper in a proofing frame (exactly the same way you would if you were making a contact print for development) and then simply place the frame, with negatives and paper enclosed, outdoors in the daylight and allow it to expose. Print-out paper is enormously convenient, but unfortunately the image it produces is unstable in terms of longevity. It can be viewed for short periods under artificial illumination, but it will rapidly fade if daylight is present. If you store your print-out proofs in an ordinary manila envelope and then only examine them from time to time, they will last for quite a while. If you leave them out on the coffee table for all to admire, the reddish-brown image will become totally brown, and the image will soon disappear.

Some photographers I know fix, wash and dry their studio proofs for permanent filing. However, this seems to me to be more trouble than it's worth as overfixing will eliminate the image, while drying a print-out proof on the cloth apron of a print dryer will infuriate its owner, as this paper leaves impossible-to-remove brown stains. Air drying is fine if you don't mind curled prints.

Regardless of which type of proofs you make, remember to handle negatives by their edges, and insert the negatives so their emulsion faces the

ONE TO ONE BILL HURTER

PRINTING-OUT OR PRINTING-IN

paper emulsion (base of negative, or shiny side, up) when placing the "sandwich" into the proof frame.

My 35mm single-lens reflex has an in-camera meter, and for most types of pictures the meter seems to work very well. However, it seems that whenever I take indoor pictures, either color or black-and-white, they seem to come out underexposed. The camera has been in for a check-up, but everything seems to be OK, so it must be something I'm doing.



All you need to make contact prints or proof sheets in broad daylight are your negatives, a proofing frame and some print-out paper such as Kodak Studio Proof Paper... and, of course, some sunlight.

Can you offer any help?—Ellen Frank, Santa Barbara, California.

Well, Ellen, I don't think you are doing anything specifically wrong, but rather it is probably the fault of your exposure meter that many of your indoor photos come out underexposed. You see, most in-camera meters are of the averaging, reflected-light type. What this means is that the scene you see in the viewfinder is analyzed by the light meter in the camera, which averages the lights and darks it sees and gives you a reading that is an average of both extremes. However, for many indoor situations, particularly ones where you have table lights or other room lights in the scene, the meter gravitates toward one of these lights and does not take into consideration the darker tones, for instance, a person sitting on a sofa ten feet from a lamp. In effect, the meter is giving you a proper exposure for the lamp and surrounding area but not for the deeper shadow areas.

A way you can avoid this type of imposed miscalculation is to move in close and meter only your subject, or to eliminate the bright light sources from your scene while you are metering, so that the meter analyzes only the parts of the scene that must be properly exposed. Set this exposure and take your photographs at the proper setting regardless of the fact that your meter may be telling you to stop down. Even though your meter may be trying to fool you, you have metered for your subject properly if you have moved in close for a reading, and your pictures should be properly exposed.

If you are in a situation where you cannot get close enough to your subject to make a close-up reading, take readings from comparable light and dark tones at your location and choose an exposure midway between the two readings. For instance, if you are in the audience at a lecture and you want to photograph the speaker but can't get close enough for a good reading, take a reading from similar light and dark tones in which you want detail and expose midway between the two. Be sensible in situations such as these, for you would not need to hold detail in the bulbs of overhead lights in your scene nor would you need detail in a tone resembling the bottom of the speaker's shoe, but perhaps a compromise in both directions would be adequate for good exposure.

Even though you move in close to take a reading, your meter can still be fooled if your scene is not an average type of scene for which meters are designed. Since light meters translate a scene into terms of middle gray, imagine what your meter would do to the proverbial black cat in the coal cellar or the beautiful blond in white skiing down the side of a snowfield. Simple—the meter wants an overexposed gray cat and an underexposed gray blond; and this is what you will get photographically unless you impose some intelligence on the readings. A way to override the variables of a scene is to carry an 18-percent-reflectance gray card such as those manufactured by Eastman Kodak, and take your readings directly from that in the same light as your scene. In this way you are measuring the volume of light rather than the variables in tonal brilliance and will thus get consistent exposure readings for each different scene you encounter.

Remembering that your meter is a tool, an instrument that translates all it sees into middle gray, will help you use your in-camera light meter more intelligently and accurately. ☐

PENTAX SYSTEM 10. THE FIRST 110 SLR AS PRECISE AS A FINE WATCH AND ALMOST AS SMALL.

Breakthrough developments are nothing new at Pentax. We practically invented the look of today's 35mm SLR, through such major innovations as the built-in pentaprism combined with the instant-return mirror, TTL (through-the-lens) metering, automatic electronic exposure, and Super-Multi-Coated lenses. In the evolution of the 35mm SLR, other companies usually follow where Pentax leads.

So it's no surprise that the newest breakthrough in SLRs comes from Pentax.

What is a surprise is that this new SLR is not a 35mm. It's the Pentax System 10. The world's first 110 SLR with interchangeable lenses, auto-winder, auto-flash, and completely-automatic programmed electronic exposure. In other words, it's the first entire SLR

system to ever appear in the compact, cartridge-loading, 110 format—complete with many of the features that are now just beginning to appear in the latest 35mm SLRs.

But that's not all. System 10 is by far the smallest and lightest SLR ever made. It measures just 2-1/5" x 3-9/10" x 1-4/5" with the standard lens. It weighs a mere 5.6 ounces. It will fit in the same area of your gadget bag where you would normally fit just one zoom lens. Or it will fit easily in your shirt pocket. And, as you'd expect, it's built with the same ruggedness and precision engineering that has made Pentax the world's largest seller of 35mm SLRs. Again, we expect to be imitated.

A NEW ERA IN 110 PHOTOGRAPHY

In the past, 110 negative images have been considered too small and grainy to be

enlarged with the kind of clarity demanded by today's photographers. But with the latest advances in 110 film resolution and Pentax lens technology, the way was cleared for a new kind of camera.

System 10 is that camera. The three, presently-available Pentax 110 lenses have been designed to optimize the potential of 110 films. System 10 lenses are so fine and so precise, that they can render a proper, razor-sharp image on the 110 negative itself. As you can see from the unretouched enlargement, our lenses are fully capable of producing color images of outstanding quality. Not just at 8"x10", but at 11"x14" also. In terms of image quality, System 10 is the first 110 camera that can honestly be favorably compared to a 35mm SLR.



PENTAX
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Unretouched enlargement from slide in lower left corner,
taken with Pentax Auto 110 camera with System 10 50mm Telephoto lens.

THE WORLD'S ONLY TOTAL-SYSTEM 110 SLR.

WITH INTERCHANGEABLE LENSES,
AUTO-WINDER, AUTO-FLASH AND PROGRAMMED AUTOMATIC EXPOSURE.



Camera shown 75% of actual size.

PROGRAMMED AUTO EXPOSURE

System 10's automatic exposure system is truly a wonder. Both aperture setting and shutter speed are programmed by the camera in accordance with the lighting conditions. By ingeniously combining the shutter with the aperture blades, Pentax engineers have created an exposure system that's amazingly sensitive and accurate, yet incredibly simple to use. System 10 even employs Silicon Photo Diodes, as opposed to the old, slow-responding CdS cells.

Shutter speeds vary from 1 sec. to 1/750 sec., while EVs range from 3 to 17 (ASA 400 with Pentax 110 24mm f/2.8 standard lens). Apertures range from f/2.8 to f/13.5.

110 SLR VIEWFINDER

As unbelievable as it may sound, the image in the viewfinder of the System 10 equals that of even the best 35mm SLRs, in terms of size, brightness, clarity and contrast.

Inside, you'll find a surprisingly large, split-image finder, surrounded by a matte glass field. You'll also see either a green or a yellow LED in the lower right corner. The green LED lights up when there's enough light for shooting at shutter speeds faster than 1/30 sec. If an exposure below that speed is required, the yellow LED lights up, meaning a tripod or flash is suggested to shoot your picture.

The split-image finder, the LEDs, and your subject are all you'll see in the viewfinder. No needles. No clutter. All you need is focus and shoot.

SUPERB LENSES

System 10 comes with a standard Pentax 110 24mm f/2.8 lens. It has 6 elements in 5

groups, and it's the equivalent of a normal 50mm lens in the 35mm format. Also available are a wide-angle 18mm f/2.8 lens, perfect for scenics or interiors, with 6 elements in 6 groups (35mm equivalent: 35mm), and a moderate telephoto 50mm f/2.8 lens, perfect for portraits and candid shots, with 5 elements in 5 groups (35mm equivalent: 100mm).

All lenses are bayonet-mount, so changing them is literally a snap.

A variety of close-up lens attachments are also



18mm wide-angle lens.



24mm standard lens.



50mm telephoto lens. Available, so you can take terrific macro shots of stamps, coins, or anything small.

WINDER 110

The Pentax Micro Power Winder can fire off exposures at 1 fps. It's compact, light, very quiet. It even automatically advances your film to the



Catch the action with the Micro Power Winder.

first frame. It's powered by two penlight AA batteries, which deliver over 1,200 exposures. And after the last exposure on the cartridge, no rewinding is necessary. Just pop out the cartridge and get it processed.

PROGRAMMED FLASH

The Auto Flash AF 130 P threads and locks into a socket on top of the System 10. It's a "dedicated" flash which automatically



synchronizes the shutter speed and aperture of the camera. It provides over 250 auto exposures (from 2.6' to 15'), all with just two 1.5V AA Alkaline batteries.

ACCESSORIES

Individual UV and skylight filters may be obtained for both standard and wide-angle lenses. Collapsible lens hoods, camera pouch, and eyepiece correction lenses as well as close up lenses are also available.

The System 10 combines the sophistication and versatility of a modern 35mm SLR with the compact ease of the 110 film format.



To the professional and the advanced amateur it's an excellent second camera that fits anywhere, and could even become your camera of choice.

To the world of photography, it's a major breakthrough. But then, that's no surprise. After all, it's made by Pentax.

Pentax System 10. (Available in limited quantities only, at select photographic stores.) For more information write: Pentax System 10, P.O. Box 2585, Littleton, Colorado 80161.

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SYSTEM 10



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